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THE MARINE OBSERVER

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COVER PHOTOGRAPH taken on board m.v. *Irma M* by Captain R.L. Westwater, at anchor Almirante during 2–4 July 1986. (See page 109.)

Letters to the Editor, and books for review, should be sent to the Editor, The Marine Observer, Meteorological Office, Eastern Road, Bracknell, Berkshire RG12 2UR

LONDON: HER MAJESTY'S STATIONERY OFFICE

EXCELLENT AWARDS 1986

Once again Excellent Awards are to be presented to 100 Masters, Principal Observing Officers and Radio Officers whose consistent efforts resulted in worthwhile and timely weather observations being made available for the benefit of forecasting and climatology; besides offering accurate weather data, the recipients have also contributed to scientific knowledge by adding ocean current entries and reports of unusual and interesting marine happenings. Details of the successful participants will be found in the accompanying lists. It should be remembered that the period considered is the 12 months of 1986 and concerns meteorological logbooks received at Bracknell during that time, and therefore may contain the names of Officers involved as long ago as the middle of 1985 or even earlier. Recipients will be notified by letter in each case, but, particularly because of the peripatetic nature of Officers' employment nowadays, leading to frequent changes of company or to shore positions, those seeing their names in the list are invited to write to Bracknell with name, address and Discharge Book or Seaman's Book number without delay. The latter are particularly important to aid identification of the correct, deserving individuals.

The following ships were included in the top six markings:

1. m.v. *Harold La Borde* (Bibby Line Ltd), Captain J.S. Gavin.
   m.v. *Remuera Bay* (P. & O. Containers Ltd), Captain W.C. Carruthers.
   m.v. *Trinidad & Tobago* (Bibby Line Ltd), Captain J.R. Hughes.
2. m.v. *Ravenscraig* (Ropner Management Ltd), Captain T. Armstrong.
   m.v. *Tolaga Bay*. (P. & O. Containers Ltd), Captain J.C. Cox.
   m.v. *Hampshire* (Bibby Line Ltd), Captain C.O. Thomas.
3. m.v. *Mairangi Bay* (P. & O. Containers Ltd), Captain C.R. Short.
4. m.v. *ACT 7* (Blue Star Ship Management Ltd), Captain D.M. McPhail.
   m.v. *Bora Universal* (Cayzer Irvine Shipping Ltd), Captains H. Jones and F. Yeulett.
   m.v. *Appleby* (Ropner Management Ltd), Captains R.J.A. Copeland and T.F. Jones.
5. m.v. *Encounter Bay* (P. & O. Containers Ltd), Captain L.E. Howell.
6. m.v. *Willowbank* (Bank Line Ltd), Captain A.B. Osborne.
   m.v. *Hoegh Duke* (Blue Star Ship Management Ltd), Captain W.A. Wilson.

Photographs of the *Harold La Borde*, *Remuera Bay* and *Ravenscraig* appear opposite page 112; a photograph of m.v. *Trinidad & Tobago* was published in our January 1986 edition.

The special book chosen this year for presentation to those who have already received two or more awards is *Ship in the Wilderness* by Snyder and Shackleton; other awards consist of *Philip's University Atlas* and *Chambers Twentieth Century Dictionary* with thumb-indexing.

J.F.T.H.

EXCELLENT AWARDS (Year ended 31 December 1986)

Captain	Company
A.F. Ainscough	Wallem S.M.S. (I.O.M.) Ltd
G.C. Alston	Palm Line Ltd
P.M. Anthony	Bank Line Ltd
T. Armstrong	Ropner Management Ltd
J.O. Bailey	B.P. Shipping Ltd
G.C. Barrett	P. & O. Containers Ltd
B.F.C. Bennett	Bank Line Ltd
P.J.S. Bishop	Denholm (I.O.M.) Ltd
T.C. Black	Blue Star Ship Management Ltd
J.K. Blackburn	P. & O. Containers Ltd
D.C. Blackman	P. & O. Containers Ltd
B. Bowtell	Shell Tankers (U.K.) Ltd
J.R. Brooks	Seaboard Offshore Ltd
R. Brownbill	Blue Star Ship Management Ltd
C.N.B. Burley	B.P. Shipping Ltd
W.C. Carruthers	P. & O. Containers Ltd
A.J. Cheshire	Blue Star Ship Management Ltd
H.M.J. Churchill	Harrisons (Clyde) Ltd
J.A. Coffin	Garth Shipping Co. Ltd
M.J. Cole	British Antarctic Survey
R.J.A. Copeland	Ropner Management Ltd
I.D. Coppack	Mobil Shipping Co. Ltd
J.A. Corcoran	Bibby Line Ltd
J. Cosker	P. & O. Containers Ltd
J.A. Cowie	Marine Nav. Co. Ltd
J.C. Cox	P. & O. Containers Ltd
J.B. Crick	Zapata Marine Services Ltd
J.A. Cullen	Marine Nav. Co. Ltd
D.L. Davidson	Shell Tankers (U.K.) Ltd
G. Davidson	Palm Line Ltd

Captain	Company
C.B. Davies	Bank Line Ltd
H.G.S. Davies	Maersk Co. Ltd
T.K. Dawson	F.T. Everard & Sons Ltd
D.A. Dornom	P. & O. Containers Ltd
H.K. Dyer	Blue Star Ship Management Ltd
C.R. Elliott	British Antarctic Survey
A. Falconer	Turnbull Scott Management Ltd
A.J.Fee	P. & O. Containers Ltd
J.R. French	Ministry of Agriculture Fisheries & Food
S.J. Gavin	Bibby Line Ltd
A.D. Gillie	London & Overseas Freighters P.L.C.
M.J.R. Godbehear	P. & O. Containers Ltd
H.A. Hall	Rowbotham Tankships Ltd
T.J.M.-Harneis	Blue Star Ship Management Ltd
D.V. Harradine	P. & O. Containers Ltd
M.J. Heron	P. & O. Containers Ltd
L.E. Howell	P. & O. Containers Ltd
J.R. Hughes	Bibby Line Ltd
P.W. Hutchinson	Blue Star Ship Management Ltd
J.E. Jennings	Ropner Management Ltd
N.D.T. Johnson	Blue Star Ship Management Ltd
H. Jones	Cayzer, Irvine Shipping Ltd
T.F. Jones	Ropner Management Ltd
M. Kichenside	Operation Raleigh
C.S. Kingston	Blue Star Ship Management Ltd
S.J. Lawrence	British Antarctic Survey
A.J. Leslie	P. & O. Containers Ltd
R.C. Lister	P. & O. Lines Ltd
S.S. Lockhart	Dept of Agriculture & Fisheries for Scotland

Excellent Awards (*contd*)

Captain	Company	Captain	Company
W.G. Lockie	Wallem S.M.S. (I.O.M.) Ltd	C.R. Short	P. & O. Containers Ltd
J.A. MacLeod	Denholm (I.O.M.) Ltd	D.K. Smith	Buries Markes (Ship Management) Ltd
W.H. Martin	Bank Line Ltd	D.E. Somes	Ocean Fleets Ltd
D.M. McPhail	Blue Star Ship Management Ltd	F. Stuart	Ropner Management Ltd
M.L. Miller	James Fisher & Sons P.L.C.	R.B. Tarbuck	London & Overseas Freighters P.L.C.
M. Muhsin	P. & O. Lines Ltd	H.J. Taylor	Bank Line Ltd
D. Newlin	Blue Star Ship Management Ltd	C.O. Thomas	Bibby Line Ltd
A.B. Osborne	Bank Line Ltd	R. Vinton	Palm Line Ltd
J.A. Oscroft	Cunard Shipping Services Ltd	J.H. Wehner	Turnbull Scott Management Ltd
A.J. Palmer	P. & O. Containers Ltd	J.W. Welch	P. & O. Containers Ltd
E.M.S. Phelps	British Antarctic Survey	M.J. Willcock	Ministry of Agriculture Fisheries & Food
D.L. Rattray	Dept of Agriculture & Fisheries for Scotland	D. Willey	Hudson S.S. Co. Ltd
		M.H. Wilson	P. & O. Lines Ltd
R. Raw	Canadian Pacific Steamships Ltd	W.A. Wilson	Blue Star Ship Management Ltd
M.M. Reeves	Bibby Line Ltd	J.P. Wishart	Ocean Fleets Ltd
K. Richmond	Wallem S.M.S. (I.O.M.) Ltd	D.H. Worrin	Maersk Co. Ltd
B.G. Roberts	Canadian Pacific Steamships Ltd	R.H. Wyatt	Curnow Shipping Ltd
G.E. Round	Blue Star Ship Management Ltd	F.H. Yeulett	Cayzer, Irvine Shipping Ltd
M. Rushbrook	Stephenson Clarke Shipping Ltd	G. Young	Stephenson Clarke Shipping Ltd
F. Shepherd	Furness Withy (Shipping)		

Principal Observing Officer	Company	Principal Observing Officer	Company
G.J. Andrews	Ocean Fleets Ltd	A.R. Hellyer	Ropner Management Ltd
S.J. Attrill	Bank Line Ltd	G.A. Hoe-Richardson	Blue Star Ship Management Ltd
L. Aye-Maung	Turnbull Scott Management Ltd	J.C. Holmes	P. & O. Lines Ltd
J.F. Badham	Canadian Pacific Steamships Ltd	G.D.S. Hope	Harrisons (Clyde) Ltd

M. Barraclough	P. & O. Containers Ltd
C.A. Bates	Buries Markes (Ship Management) Ltd
P.M. Beggs	P. & O. Containers Ltd
M.S. Bell	Cunard Shipping Services Ltd
D.L. Beveridge	Dept of Agriculture & Fisheries for Scotland
K.L. Brooks	Furness Withy (Shipping) Ltd
R.J. Buckley	P. & O. Containers Ltd
K.M. Calladine	Mobil Shipping Co. Ltd
L. St J. Campbell	Blue Star Ship Management Ltd
P.A. Carmichael	Ropner Management Ltd
V. Chand	Marine Nav. Co. Ltd
B.A. Chapman	Ministry of Agriculture Fisheries & Food
N.W. Conquest	Palm Line Ltd
N.D.R. Copeman-Mitchell	P. & O. Containers Ltd
D. Cramer	Bibby Line Ltd
R.J. Curry	P. & O. Containers Ltd
R.I. Cuthbert	James Fisher & Sons P.L.C.
M. Ellis	Blue Star Ship Management Ltd
B. Elston	Blue Star Ship Management Ltd
D.B. Flood	Cayzer, Irvine Shipping Ltd
N.E. Gardiner	P. & O. Containers Ltd
I.D. Gordon	Bibby Line Ltd
M.R. Gover	Garth Shipping Co. Ltd
J.N. Gregson	B.P. Shipping Ltd
B.A. Hall	Dept of Agriculture & Fisheries for
A.D. Hammond	Shell Tankers (U.K.) Ltd
P.J. Hancock	Palm Line Ltd
C.N. Hardy	Bank Line
D. Harnett	Canadian Pacific Steamships Ltd
J. Harrison	Curnow Shipping Ltd
J.M. Harrison	Denholm (I.O.M.) Ltd
J.R. Harper	British Antarctic Survey
A. Haynes	Bank Line Ltd
D.L. Haynes	P. & O. Containers Ltd
P. Johnson	P. & O. Containers Ltd
D.W. Jones	P. & O. Lines Ltd
N.C. Jones	P. & O. Containers Ltd
S.A.C. Jones	Rowbotham Tankships Ltd
A.M. Leech	P. & O. Containers Ltd
D.R. Lewis	P. & O. Containers Ltd
M.C. Littlewood	London & Overseas Freighters P.L.C.
P.F.M. Lovett	Turnbull Scott Management Ltd
K.C. MacLean	Cayzer, Irvine Shipping Ltd
D.J. MacLellan	Seaboard Offshore Ltd
M.N. Mace	Blue Star Line Ship Management Ltd
A.K. Maltby	Natural Environment Research Council
S.J. Miller (Miss)	P. & O. Lines Ltd
G.R. Mills	Ocean Fleets Ltd
W.P. Mitchell	Blue Star Ship Management Ltd
R.C. Mitcheson	Stephenson Clarke Shipping Ltd
A. Monteath	F.T. Everard & Sons Ltd
R.D. Moore	Palm Line Ltd
G.C. Morgan	Maersk Co. Ltd
T.S. Moseley	Hundson S.S. Co. Ltd
K.P. Mowat	Bank Line Ltd
L.H. Musselwhite	Bibby Line Ltd
N.J. Nash	Cunard Shipping Services Ltd
R.G.C. Noble	Ben Line Steamers Ltd
S.H. Pearce	P. & O. Containers Ltd
E.W. Pearson	Ministry of Agriculture Fisheries & Food
A.G. Pompa	Esso Petroleum Co. Ltd
V. Radley	B.P. Shipping Ltd
N. Rich	Bank Line Ltd
A.H. Roberts	Wallem S.M.S. (I.O.M.) Ltd
S.A. Robinson	Maersk Co. Ltd
C.A. Rose	Jebsens Ship Management Ltd
J. Ross	Dept of Agriculture & Fisheries for Scotland
P.C. Sargeant	British Antarctic Survey

Excellent Awards (*contd*)

Principal Observing Officer	Company
N. Sheard	Zapata Marine Services Ltd
C.R.D. Soames	B.P. Shipping Ltd
A. Stangroom	Bank Line Ltd
P.M. Steele	Shell Tankers (U.K.) Ltd
G.C. Stock	Blue Star Ship Management Ltd
W.J. Stoker	P. & O. Containers Ltd
D. Taylor	Operation Raleigh
D.J. Vickery	Ropner Management Ltd
R. Walker	P. & O. Containers Ltd
S.L.J. Walker	Bibby Line Ltd
D.S. Warren	Shell Tankers (U.K.) Ltd
M.B. Wdowikowski	Stephenson Clarke Shipping Ltd
M.J. Webber	London & Overseas Freighters P.L.C.
F.G.M. Whitaker	Denholm (I.O.M.) Ltd
E.A. White	Blue Star Ship Management Ltd
A.W. Whiteford	Canadian Pacific Steamships Ltd
H.R. Wilks	Turnbull Scott Management Ltd
D.J. Williams	Wallem S.M.S. (I.O.M.) Ltd
W.M. Winter (Miss)	P. & O. Containers Ltd
H.D. Woodcock	Bibby Line Ltd

Radio Officer	Company
I.F. Alexander	London & Overseas Freighters P.L.C.
N.A. Allison	Wallem S.M.S. (I.O.M.) Ltd
J. Barkess	Dept of Agriculture & Fisheries for Scotland
G.N. Basnett	P. & O. Lines Ltd
R. Baty	Marconi International Marine Co. Ltd
D.E. Beech	Radio & Electronic Services Ltd
P. Hodge	Garth Shipping Co. Ltd
A.D. Hutchinson	P. & O. Containers Ltd
D.J. I'Anson	Canadian Pacific Steamships Ltd
D.K. Iveson	S.T. & Co. International Marine Ltd
M.C.J. Jewell*	Department of Agriculture & Fisheries for Scotland
J. Jones	Caledonian MacBrayne Ltd

R.C. Boyle	... ...	P. & O. Lines Ltd
R.P. Bradsell	... ...	Wallem S.M.S. (I.O.M.) Ltd
S.J. Braithwaite	... ...	P. & O. Containers Ltd
J.R. Bruce	... ...	B.P. Shipping Ltd
D.J. Busveids	... ...	Canadian Pacific Steamships Ltd
S.D. Buxton	... ...	British Antarctic Survey
J.A. Carroll	... ...	P. & O. Lines Ltd
C.S. Carver	... ...	Radio & Electronic Services Ltd
B. Casey	... ...	B.P. Shipping Ltd
R.D. Cause	... ...	P. & O. Containers Ltd
C. Constantinou	... ...	P. & O. Containers Ltd
J.J. Cooney	... ...	Radio & Electronic Services Ltd
W.H. Coventry	... ...	P. & O. Containers Ltd
J.J. Coyle*	... ...	Dept of Agriculture & Fisheries for Scotland
A.B.K. Crosland	... ...	Cayzer, Irvine Shipping Ltd
J. Cully	... ...	Shell Tankers (U.K.) Ltd
P.B. Davies	... ...	S.T. & C. International Marine Ltd
A.L. Dobson	... ...	Marconi International Marine Co. Ltd
R.K.A. Douglas	... ...	Electro-Nv. International Ltd
J. Drury*	... ...	Zapata Marine Services Ltd
R.S. Duff	... ...	Marconi International Marine Co. Ltd
S. Dunbar*	... ...	Zapata Marine Services Ltd
T.S. Elliott	... ...	Bibby Line Ltd
G.K. Emmett	... ...	Shell Tankers (U.K.) Ltd
P.C.A. Enrico	... ...	P. & O. LinesLtd
G.C. Evans	... ...	Shell Tankers (U.K.) Ltd
D.S. Flemington	... ...	P. & O. Containers Ltd
B.J. Foley	... ...	Bibby Line Ltd
K.J.J. Gaughan	... ...	P. & O. Containers Ltd
W.D. Godden	... ...	Marconi International Marine Co. Ltd
R.I. Gow	... ...	E.B. Communications (G.B.) Ltd
M.R.T. Hannan	... ...	P. & O. Containers Ltd
N.W. Harrison	... ...	P. & O. Lines Ltd
M.R. Hewitt	... ...	B.P. Shipping Ltd
M.C. Hill	... ...	Quadrant Marine Ltd
D.A. Kelsall	... ...	P. & O. Containers Ltd
C. Keohane	... ...	Bibby Line Ltd
D. Kerslake	... ...	Cunard Shipping Services Ltd
F.S. Khan	... ...	B.P.Shipping Ltd
R.C. Knott	... ...	S.T. & C. International Marine Ltd
S.C. Langlois	... ...	Harrison (Clyde) Ltd
P.V. Lintzgy	... ...	Turnbull Scott Management Ltd
P.A. Lloyd*	... ...	Sealink (U.K.) Ltd
R.J. MacDonald	... ...	Ben Line Steamers Ltd
W.B. Macintosh	... ...	P. & O. Containers Ltd
N. MacIver*	... ...	Dept of Agriculture & Fisheries for Scotland
I.M. MacLeod	... ...	Seaboard Offshore Ltd
P.A. Mathews	... ...	P. & O. Containers Ltd
B.W. Matten	... ...	P. & O. Containers Ltd
J.A. McKay	... ...	P. & O. Containers Ltd
H.G. Moran	... ...	S.T. & Co. International Marine Ltd
M.F. Morgan	... ...	S.T. & Co. International Marine Ltd
J. Nolan	... ...	Ocean Fleets Ltd
I.C. Petrie	... ...	Stephenson Clarke Shipping Ltd
P.N. Pouchet	... ...	S.T. & C. International Marine Ltd
D.A. Pugh	... ...	Ocean Fleets Ltd
D.P. Riddle	... ...	Marconi International Marine Co. Ltd
C.T. Robinson	... ...	Marconi International Marine Co. Ltd
N. Rond	... ...	Hudson S.S. Co. Ltd
A.H. Ross*	... ...	Carisbrook Shipping Ltd
N.E. Scott	... ...	S.T. & C. International Marine Ltd
T. Searle	... ...	P. & O. Containers Ltd
J. Seymour	... ...	F.B. Communications (G.B.) Ltd
G.N. Shaw	... ...	S.T. & C. International Marine Co. Ltd
R.J. Sheldon*	... ...	Dept of Agriculture & Fisheries for Scotland
G.J. Simpson	... ...	Bibby Line Ltd
N.R. Smirk	... ...	S.T. & C. International Marine Ltd
D.G. Smith*	... ...	Carisbrook Shipping Ltd
T.J. Smith	... ...	P. & O. Containers Ltd

Excellent Awards (*contd*)

Radio Officer	Company	Radio Officer	Company
E.B. Stephenson	P. & O. Containers Ltd	D.M. Unvala	Marine Nav. Co. Ltd
R. Stevens	Marconi International Marine Co. Ltd	R. Wade	British Antarctic Survey
D. Stewart	Marconi International Marine Co. Ltd	M.C. Wakelin	B.P. Shipping Ltd
A.R. Taylor	Radio & Electronic Services Ltd	F.W. Wilson*	Seaboard Offshore Ltd
J.C. Thompson	P. & O. Containers Ltd	R.A. Wilson	Curnow Shipping Ltd
C.K. Thornally	P. & Co. Containers Ltd	J.F. Worcester	Radio & Electronic Services Ltd
M.J. Tindall	Buries Markes (Ship Management) Ltd	J.C. Yates	S.T. & C. International Marine Ltd
A. Titley	P. & O. Containers Ltd	G.A. Zimmer*	F.T. Everard & Sons Ltd

'MARID' SHIPS†

Captain	Principal Observing Officer	Radio Officer	Company
R. Hopkins, S. Isaac	A. Germanicos	—	British Dredging Aggregates Ltd
N. Powell	M. Dale, A. Parry	—	Esso Petroleum Co. Ltd
P.R. Thompson	A. Wormald, A.P.M. Fraser	—	Stephenson Clarke Shipping Ltd

* Deck Officer.
† Vessels recruited for the purpose of observing and transmitting sea temperatures with non-instrumental observations in the North Sea.

July, August, September

The Marine Observers' Log is a quarterly selection of observations of interest and value. The observations are derived from the logbooks of marine observers and from individual manuscripts. Responsibility for each observation rests with the contributor.

Observing officers are reminded that preserved samples of discoloured water, luminescent water, etc. considerably enhance the value of such an observation. Port Meteorological Officers in the U.K. will supply instructions on how to preserve and pack such samples on request.

TYPHOON 'ABBY'

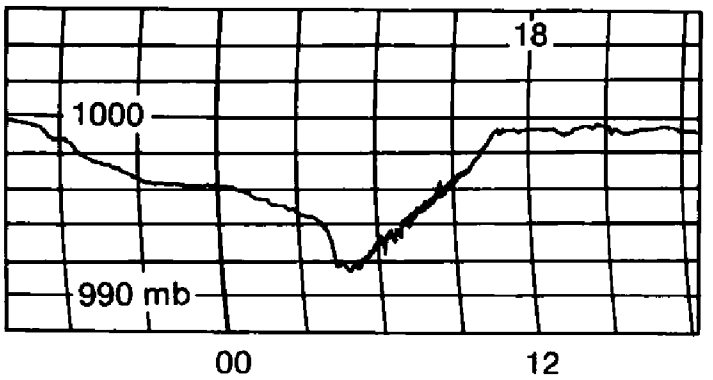
South China Sea

m.v. *Cardigan Bay*. Captain R.J. Bland. At Kaohsiung and on passage to Hong Kong. Observers: The Master and ship's company.

17–19 September 1986. Reports were initially received from Hong Kong and Tokyo weather centres which predicted the typhoon's centre to move north-west to a position some 300 n.mile east of Taiwan, then curve north towards Japan. However, during the twenty-four hours while the vessel was alongside in Kaohsiung, it became apparent that the centre was not curving to the north, but was continuing on its westerly track and would pass through the centre of the country.

The pressure during the preceding thirty-six hours had fallen steadily from an average of 1008 mb to 996 mb, but the weather had remained good, with light winds and partly clouded skies.

By 0200, when the Pilot boarded, the wind had increased to N'ly, force 6, and the sky had become heavily overcast. The vessel was clear of the port by 0300, when the pressure suddenly fell sharply, and the wind increased to N'ly, force 8/9; during the next few hours, the vessel passed through large areas of squally rain with poor visibility. The pressure levelled out at 991.5 mb at 0500, see barogram, by which time the wind was gusting N'ly, force 10/11, and the vessel



was rolling and pitching heavily in a 9-m beam sea, taking heavy spray over the starboard side. At 0530 the pressure began to rise, but the wind remained steady in force and direction until 0930 when it decreased to N'ly, force 8, and the showers became less frequent.

The wind continued decreasing to force 4, having backed to NW'ly by 1400, and the cloud cover began to break, the rain ceased at about 1700.

As the vessel arrived in Hong Kong, the wind was still fairly fresh at NW'ly, force 6, but this was caused by a rather strong monsoon, not particularly by the typhoon, which had been downgraded to a tropical storm and had deviated in a north-easterly direction back into the Pacific just before reaching Taiwan.

Position of ship on the 17th: 22° 36′N, 120° 16′E.

HEAVY WEATHER

South Atlantic Ocean

m.v. *Maersk Harrier*. Captain H.G.S. Davies. Falkland Islands to Ascension Island. Observers: The Master and ship's company.

24–26 August 1986. Between these dates, the vessel encountered rough weather associated with an intense depression. The vessel had been receiving facsimile maps from Argentina, the last being received at 1200 GMT on the 24th, which gave no indication of the bad weather to come. The following observations were made during the above period.

Date and time (GMT)	Wind Dir'n	Force	State of sea	Dry Bulb (°C)	Pressure and Remarks
24th 1200	E	4	Slight	10.5	997.8 mb. Wind dropped, fog 1330. Haze, 1415. Drizzle for an hour, 1430.
1500	E	3/4	Slight	9.5	996.1 mb.
1800	NW	3	Slight	13.3	994.2 mb. Wind W'ly, force 6, increasing, 1930–1940.
2100	NW	3	Rough		991.7 mb.
25th 0000	WSW	8	Rough/High	10.1	991.7 mb. Swell confused.
0300	WSW	8	Rough/High	10.5	991.5 mb. Swell starting to build from WSW.
0600	WSW	7	Rough	11.2	990.9 mb.
0900	WSW	8	Rough		Alter course 0930 to 060°, owing to stress of weather.

	1100	WSW	11/12	Precipitous	11.0	995.4 mb.
	1200	W'S	10/11	Precipitous	11.0	994.5 mb.
	1500	W'S	10/11	Precipitous	10.5	995.5 mb.
	1800	WSW	8/9	Very High/ precipitous	12.9	997.4 mb. Swell height now 10 m. Alter course 1900 to 026°.
	2300	WSW	9	Precipitous	12.8	1004.9 mb. Cloud clearing from north, wind decreasing slowly.
26th	0000	W'S	9	Very high	12.0	1006.3 mb.
	0300	W'S	9	Very high	12.5	1009.1 mb. Overcast.
	0600	WSW	7	High	13.0	1012.1 mb.
	0700	SW	8	High	13.2	1012.0 mb.
	1200	WSW	5	Rough	14.3	1017.4 mb. Cumulus and stratocumulus at different levels, with altocumulus of a chaotic sky.
	1500	WSW	4/5	Rough	16.5	1018.3 mb.

The wind had dropped to S'ly, force 3 by 0700 on the 27th, and the swell decreased slowly, becoming 3 m high by 1800 the same day.

Position of ship at 1200 GMT on the 25th: 38° 30'S, 48° 06'W.

Position of ship at 1200 GMT on the 26th: 35° 12'S, 45° 00'W.

WATERSPOUT

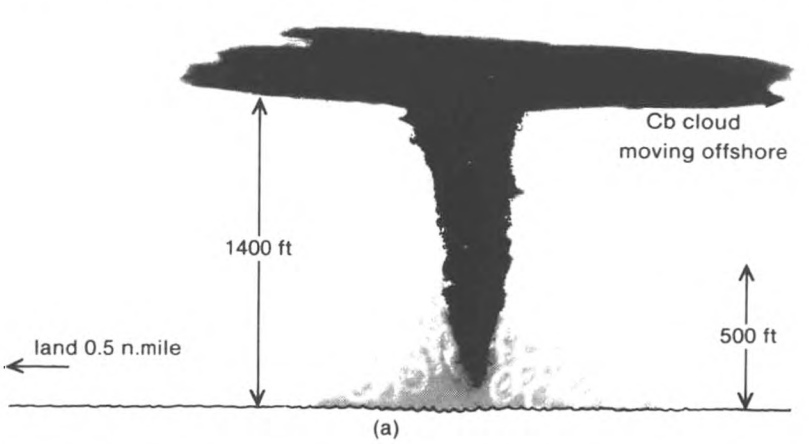
Caribbean Sea

m.v. *Salmonpool.* Captain R.A. Copeland. Port Rhoades to Gramercy. Observers: Mr D. Lundy, 3rd Officer and Mr D.C. Bullard, Radio Officer.

22 September 1986. Between 1620 GMT and 1645 GMT, whilst rounding Cabo San Antonio from the south-east, the vessel encountered a very heavy thunderstorm which impaired the visibility, reducing it from 15 n.mile to 4 n.mile within minutes.

At 1600 the vessel altered course from 295° to 331° and passed out of the storm. Then, on the starboard quarter, a large waterspout was observed to be forming. It was at a distance of no more than 0.5 n.mile from the coastline, and was about 1400 feet in height.

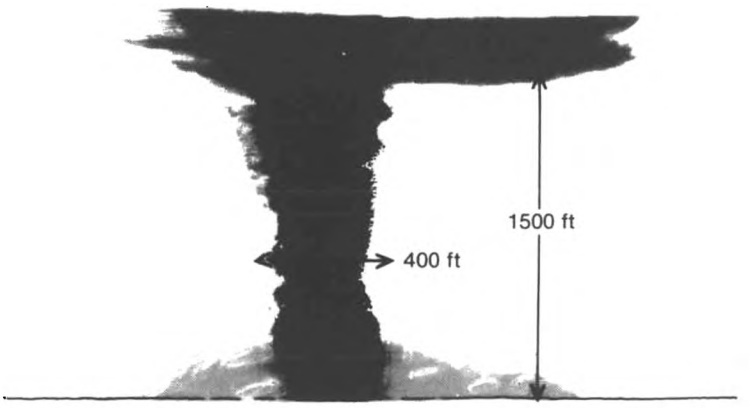
When first observed, see sketch (a), it was forming downwards from the base of a cumulonimbus cloud, with the water surface below very agitated at first, and



(a)

then in turmoil. At this time, the base of the spout was about 500 feet above sea level, and was funnel-shaped; the area of disturbance over the sea was about

0.5 n.mile. After ten minutes, the spout dipped into the sea and gradually widened; at its greatest, it was approximately 400 feet in diameter, 1500 feet high, and in very fast rotation, see sketch (b).



(b)

After twenty-five minutes, the diameter narrowed and the spout retracted from the surface, while at the same time, the rotation seemed to slow, and the spout began to dissipate.

At all times, the spout was at a distance of 4 n.mile or more from the ship, and no observation of the wind speed and direction could be made near to it; however, at the ship, it remained constant at NNE'ly, force 3.

The dry bulb temperature was 29.0 °C, pressure was 1016 mb, with no significant change in the barograph trace.

Position of ship: 22° 06′N, 85° 12′W.

CURRENTS

Indian Ocean

m.v. *Bora Universal.* Captain F. Yeulett. Maputo to Sharjah. Observers: Mr R. Kendall, Chief Officer, Mr P.J. Taylor, 2nd Officer, Mr D.B. Flood, 3rd Officer, Mr A. Willis, Radio Officer and ship's company.

9 July 1986. At about 0715 GMT a distinct line of breaking water (white) ahead was noticed by the Second and Third Officers. As the ship approached the 'spot', they watched, expecting a line-squall, but nothing materialized. Instead, as the bow crossed the line, the vessel sheared away from its course of 020° gyro to 355° gyro. The autopilot could not cope, so hand steering was needed. Just to bring the vessel back needed most of the helm.

Eight minutes later, a similar line of white water was crossed by the ship; this time it roared away to starboard from its original course of 020° gyro to 043° gyro. Again, a great deal of helm was needed just to hold the vessel.

As the lines of broken water were crossed, it was noticed that they looked just like 'overfalls' i.e., smooth water and then the breaking water, so the echo sounder (and graph) was turned on and left running, even though the charted depth was in excess of 5000 m.

Several more lines of broken water were met with during the next forty-five minutes, and every time one was crossed, the echo-graph went from 'clear' to a sounding of only 3 m under the keel (i.e., a depth of 10 m). As the next line was

cleared, the graph went clear too. There was no change in the sea temperature, when tested on both sides of the ship, it remained between 25.0 °C and 25.5.

On crossing each line of white water, the sea became considerably rougher than the actual following wind of force 4 could produce, and there were waves breaking on both sides of the vessel, with the spray reaching almost to the forward mast-head height and soaking the decks forward.

The white water stretched right ahead as far as the eye could see, so the course was adjusted to take the ship off the line and into clear water.

Although the splitting of currents in this area (north-north-east at 2.5 knots, and south-east at 1.5 knots) could be the explanation for the difficulties encountered, no possible reason could be found for the recordings on the echo sounder as they were quite positive, and definitely registered at each line of broken water, maybe they were of a different density.

Position of ship: 05° 25′N, 52° 15′E.

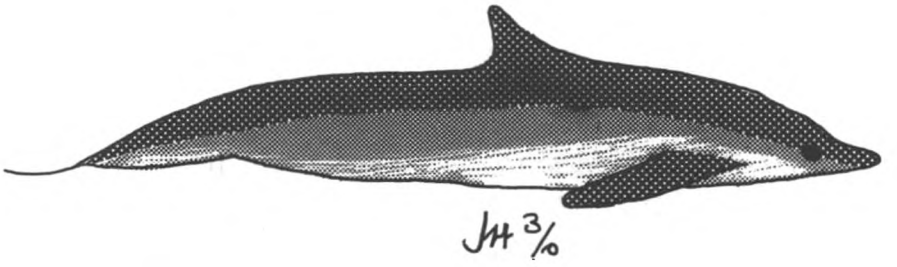
CETACEA

Eastern North Atlantic

R.M.S. *St Helena*. Captain R.H. Wyatt. Tenerife to Ascension Island. Observers: the Master, Mr J. Harrison, 3rd Officer and a number of passengers.

19 September 1986. Shortly before lunch, a large school of dolphins was observed heading towards the ship. Upon reaching it, they reversed direction and started to jump out of the water and ride on the bow wave.

The group consisted of about 30 dolphins, many of which appeared to be juvenile. The largest dolphins were between 1.8 m and 2.8 m in length, and, as shown in the sketch, were dark grey in colour with light grey undersides. The



juveniles were approximately one third to one half of the previously mentioned lengths.

The school was close to the ship for a very short period of time, but could be observed through binoculars 'playing around' for about ten minutes afterwards. It was thought that they could have been Bottlenose Dolphins, but on looking at photographs published in *The Marine Observer* of April 1986, it is thought they may have been Short-beaked Spinners.

The sea state at the time was slight, with a NW'ly swell, and the sea temperature was 28.7 °C.

Position of ship: 12° 54′N, 17° 54′W.

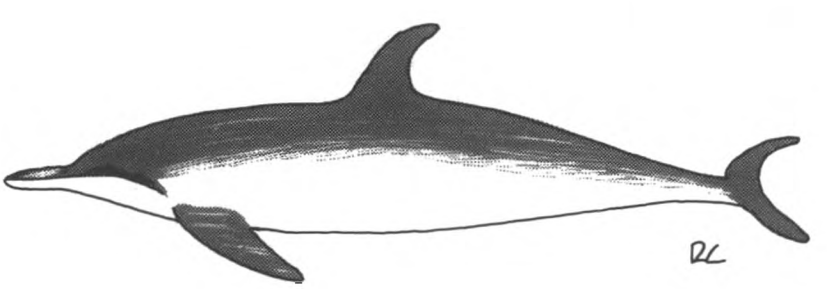
Note. Mr D.A. McBrearty, of the Department of Anatomy, University of Cambridge, comments:

'This is a difficult one for me to interpret insomuch as both species mentioned by the observers are to be found in that sea area, and while the observers have the benefit of looking at the actual dolphins, I have only the report. Unfortunately, there is a further problem in that yet another species is to be found in this sea area, and should be considered along with the others. This is the Atlantic Spotted Dolphin (*Stenella plagiodon*). The observers note that many of the dolphins seen appeared to be juveniles; now, it so happens that Spotted Dolphins are actually unspotted at birth and as juveniles, the spotting develops only gradually with physical maturity. The young Spotted Dolphin could very easily be mistaken for a young Bottlenose Dolphin (*Tursiops*). On the basis of the drawing supplied by the observers, I favour their first impressions. (See also *The Marine Observer*, October 1986, p. 186.)'

Indian Ocean

m.v. *Tor Bay*. Captain M.J. Godbehear. Mina Qaboos to Singapore. Observer: Mr R.J. Curry, 3rd Officer.

10 August 1986. At 0300 GMT a small school of dolphins was observed fine on the starboard bow, about 1.5 n.mile away. When viewed through binoculars, it could be seen that although the dolphins were jumping out of the water to a certain extent, they were clearly not wasting any time being playful, but were swimming hard on a reciprocal course to that of the ship. The dolphins closed the ship in a matter of minutes, and as they did so, other dolphins were joining the school from the left and right, so that by the time they reached the ship, they had made a wedge-shape formation consisting of some 30–35 individuals, one of which is shown in the sketch.



The dolphins were identified as spinners; the group comprised some 25 adults and about 8 smaller dolphins which were thought to be juveniles. The adults were estimated to be roughly 2 m long, and had pointed snouts, their backs were dark grey (almost black) in colour, which became lighter on the flanks, with the belly being a creamy-white colour.

At first it was thought the dolphins were swimming towards the vessel to play in and ride on the pressure wave provided by the ship. Instead, however, the school swam past *Tor Bay* no more than 50 m distance from the starboard beam, and carried on until it reached the *Toyama*, a tri-screw Norwegian container ship which was overtaking us. The dolphins then began playing in her bow-wave.

Is it possible that they could have been attracted to her because of the greater engine noise and the thrash of her three propellors, as opposed to the *Tor Bay*'s one engine and one screw?

The sea temperature was 28.6 °C and the sea state was slight to moderate with a low W'ly swell.

Position of ship: 05° 51'N, 86° 08'E.

Note. Mr D.A. McBrearty comments:

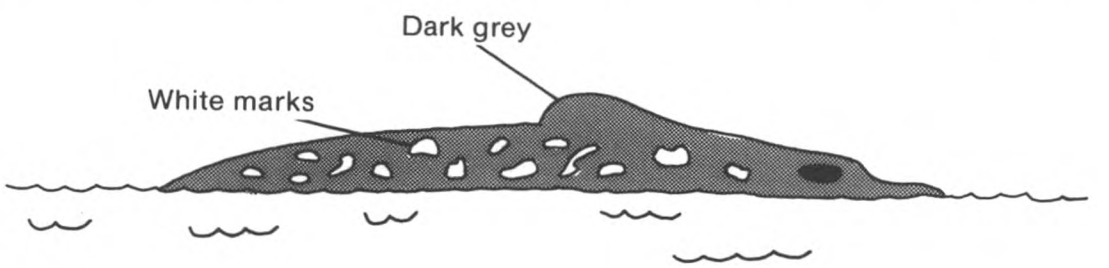
'It certainly looks as if the greater thrash and noise of the larger ship was the attraction which sent these dolphins past *Tor Bay*. Our interpretation of why they do it is perhaps more difficult. It would be rather nice to think that it is all done for "fun", and perhaps occasionally, it is; however, I think there is mostly more to it than that. Finding food is one of the chief preoccupations of dolphins, and perhaps the vibrations of an approaching vessel tend to drive fish before it and thus provide concentrations which the dolphins can snap up. Almost the only fish a mariner sees are the tropical flying fish, and most observations of these are ahead of, and away from the ship's track at right-angles, other fish species would not be seen from the ship. The bow-riding behaviour provides an effortless means of transport "between meals".'

Western North Pacific

m.v. *Melampus*. Captain M.J. Knight. Yokohama to Los Angeles. Observer: Mr G.J. Andrews, 3rd Officer.

5 September 1986. At 0300 GMT, what appeared to be either two large dolphins or two small whales were spotted on the port beam. They were about 3.7 m long, and were lying on the surface of the sea with little movement.

They were dark grey in colour, with a pattern of white spots on their backs, as shown in the sketch. A small dorsal fin was visible, but not much of the head. It is



thought that they may have been a couple of large Spotted Dolphins (*Stenella plagiodon*).

At the same time, a school of Bottlenose Dolphins was seen on the bow. They were jumping well clear of the water, and stayed around the ship for about five minutes before heading off to the south.

Position of ship: 36° 42'N, 143° 37'E.

Note. Mr D.A. McBrearty comments:

'At 3.6 m in length, these animals were much too large to have been any of the *Stenella* spp. as suggested by the observer. In my opinion, a more likely explanation would be that these were a couple of smaller, beaked whales. The dark grey of the back, together with the white spots and splashes suggest *Mesoplodon* spp. possibly *M. densirostris*. The beaked whales, as a group, tend to be rather shy of ships, and consequently,the appearance and behaviour of many of them, in the wild, is largely unknown. Good photographs can be a help in identification of beaked whales, but are still no guarantee. The drawing supplied by the observer has one factor not compatible with a beaked whale, the position of the dorsal fin which would have been further towards the flukes.'

South Pacific Ocean

m.v. *Willowbank*. Captain A.B. Osborne. Long Beach to Auckland. Observers: Mr A. Stangroom, 3rd Officer, Mr D. Roberts, 2nd Engineer Officer and Mr J. Stevenson, 4th Engineer Officer.

6 September 1986. At 1045 GMT the first of several Sperm Whales was observed about 6–7 cables to starboard, heading east and blowing every 8–10

seconds. It stopped when about 4–5 cables off and waited for the ship to pass; once we were well clear, it resumed its course. It was then that another blow was noticed 100 m astern of the first, and finally, another one 150 m behind that. These whales too were heading east, and did not dive during the five minutes for which they were observed. Interestingly enough, when the first whale stopped, it appeared to have its tail down, as the area behind the fin was not visibile until it resumed its course. All three whales were a brown/grey colour and were about 12 m to 15 m long.

Five minutes later, two more blows were seen; one was fine to starboard, and the second was fine to port and farther away. As the ship approached, it became quite clear that it was going to pass very close to the one on the starboard side, which was heading east, hence crossing the bow, so more attention was devoted to that one. We were going to pass so close in fact that we nearly had to alter course for it. It was eventually passed about 10 m down the port side. When it was just forward of the beam, it humped its tailstock, raised its flukes slightly, and made a shallow dive. As we passed, its tail could be seen as a dark patch just beneath the surface, so it had not gone to any depth.

A few minutes later, a large Sperm Whale was spotted close to the port side, about 150 m away, and this one, after taking a breath, stayed underwater until the ship was well clear. It did not raise its flukes or hump its tailstock.

Twenty minutes later, another whale was seen a good mile away and about 20° off the starboard bow. It too was heading east, and as the ship was going to pass quite close to it, members of the ship's company were alerted to have a look. This whale stopped about 3 cables out, and when it was abeam of the ship, it rolled into a dive, throwing its broad flukes well clear of the water before finally sinking out of sight. While the attention of several observers was being focussed on another whale to port, the Third Officer spotted one fine to starboard, no more than 25 m away, having appeared from nowhere and heading straight across the bow at right-angles. The wheel was slammed hard to starboard by the Third Officer who then went to the port bridge wing hoping to see the whale. After a few long seconds it appeared just to port, its tailstock being pushed forward by the bow wave. It then straightened up and submerged, and a full view was had of the 12-m whale some 2 m underwater as the ship passed by it. No damage was seen on it and it was watched blowing astern, so it was assumed that everything was alright. The observers on the bridge were quite convinced that the whale would have been rammed had not evasive action been taken.

The question arose: why did some whales quite sensibly stop at a safe distance and let the ship pass, while others allowed themselves to get perilously close to it?

Position of ship: 29° 23′S, 178° 16′E.

FISH

North Atlantic Ocean

m.v. *Trinidad and Tobago*. Captain J.R. Hughes. Point Lisas to Rotterdam. Observers: the Master and majority of ship's company.

7 July 1986. At 1945 GMT whilst the ship was on passage at a speed of 10 knots, a fish was caught. It was 1.1 m long, and weighed 9 kg. On the

upperside, it was a silvery colour, with more pale vertical stripes running down its sides and merging with the white underparts. The fish is shown in a photograph opposite page 113.

Position of ship: 27° 22′N, 46° 48′W.

Note. Dr F. Evans, of the Dove Marine Laboratory, University of Newcastle upon Tyne, comments:

'The fish is a fine specimen of a Wahoo, *Acanthocybium solandri*. It is easily recognised as a scombrid i.e., one of the mackerel and tunny family, by the lines of small finlets on the upper and undersides in front of the tail fin. Both jaws have a row of very sharp teeth, and the species is a fish predator. They are usually solitary, and not common. I myself have only ever seen one example, in mid-Atlantic. They are distributed tropically and subtropically in all oceans, and are believed to be among the fastest of all fish, capable of over 40 knots.'

SHARKS

North Atlantic Ocean

m.v. *Garinda*. Captain J.A. Smeeton. Sullom Voe to Houston. Observers: the Master, Mr J.B. Moulds, 3rd Officer, Mr M.B. Smith, Radio Officer and ship's company.

22 July 1986. Whilst observing a group of some five or six Sperm Wales, passing at a distance of about 1 n.mile to starboard, an object was noticed a mile or so farther away, lying low in the water, and occasionally obscured by the swell.

Bringing binoculars to bear, it was found to resemble nothing so much as the hull of an upturned small boat, having the colour of sun-bleached 'international orange' paint, and with a patch of what appeared to be oil spreading downwind from it. The Master was called to the bridge, and the vessel brought round to pass close by the object. Alerted by the turn, several members of the ship's company moved to the rail to watch, whilst on the bridge, there was considerable debate as to the nature of the 'thing'.

As the object drew near, it was seen to be an unhealthy and uneven sun-bleached yellow in colour, somewhat irregular in shape and with a surface texture resembling canvas. Passing about 50 m off the ship's side, it rolled slightly to the bow wave, revealing a large mouth, filled with several rows of dangerous-looking triangular teeth. This was clearly observed from the bridge, and the consensus of opinion was that the object was the remains of an extremely large shark, possibly a Great White.

The blunt head was estimated to be between 1.5 m and 1.8 m across, and the body had apparently been severed or eaten away, at a point just abaft the gills, leaving the head and forepart with a length of perhaps 2.4 m to 2.7 m! What may have been entrails were visible beneath the surface, and several smaller sharks were seen cruising about the corpse, their dorsal fins occasionally breaking the surface.

The above dimensions were arrived at from the observations of several experienced seafarers, and the size of the beast when alive is a matter for conjecture, although its dentistry leaves little doubt regarding its demeanour!

The sea-water temperature was 25.5 °C, and the sea was calm with a long swell of roughly 2 m, the visibility was excellent at 27 n.mile.

Position of ship: 38° 23′N, 44° 40′W.

Note. Dr F. Evans comments:

'The identification was undoubtedly correct. It was a White Shark, *Carcharodon rondeleti.* This one truly deserves the epithet "great". With a head and fore part of 2.4 m to 2.7 m, we have an animal of a total length in the region of 11–12 m and weighing perhaps 15 272 kg (15 tons). This is approaching the largest reported size for the species. No other shark, apart from the Whale Shark (which has only very small teeth) grows so large. The term "white" refers to the colour of the belly. In the Atlantic, White Sharks are thought to be species of temperate waters, occurring within the isotherms of 12 °C and 25°.

'I congratulate the observers on this fine and memorable sighting. Interestingly, while White Sharks of this size are known to have teeth three inches long, shark teeth as long as five inches are sometimes dredged up from the bed of the deep oceans. I leave the calculation to the reader.'

South China Sea

m.v. *British Ranger.* Captain J.O. Bailey. At anchor. Brunei. Observers: the Master and members of the ship's company.

1 September 1986. A line, hook and bait had been left over the side during the previous night, and at about 2300 GMT on the 1st, the shark shown in the photograph opposite page 113 was discovered on the line.

It was eventually landed on board using a wire and ship's gantry crane, and was found to be female, containing a dozen unlaid eggs. The shark's vital statistics were: length 3.7 m, girth 1.6 m, weight 282 kg.

Position of ship: 05° 25′N, 114° 42′E.

Note. Dr F. Evans comments:

'From the rounded shape of the head, this was a very large Nurse Shark of the genus *Ginglymostoma* of which there are several, species. Nurse Sharks grow to a length of 1.8–3.7 m, so this one was among the biggest. They are often shore-dwelling creatures, sluggish and inoffensive, and may often be seen basking in the sunshine in small groups, or nosing about in search of food among masses of seaweed or pieces of loose coral.

'They have been recorded as eating small fish, squid, cuttlefish, shrimps, lobsters, crabs, sea-urchins and other shellfish. Sometimes they are found in water so shallow that their dorsal fins project above the surface. One researcher recorded how his assistants "used to drive them into shallow water, catch and drag them up on the beach and after I had finished measuring and examining them, put them back in the water".'

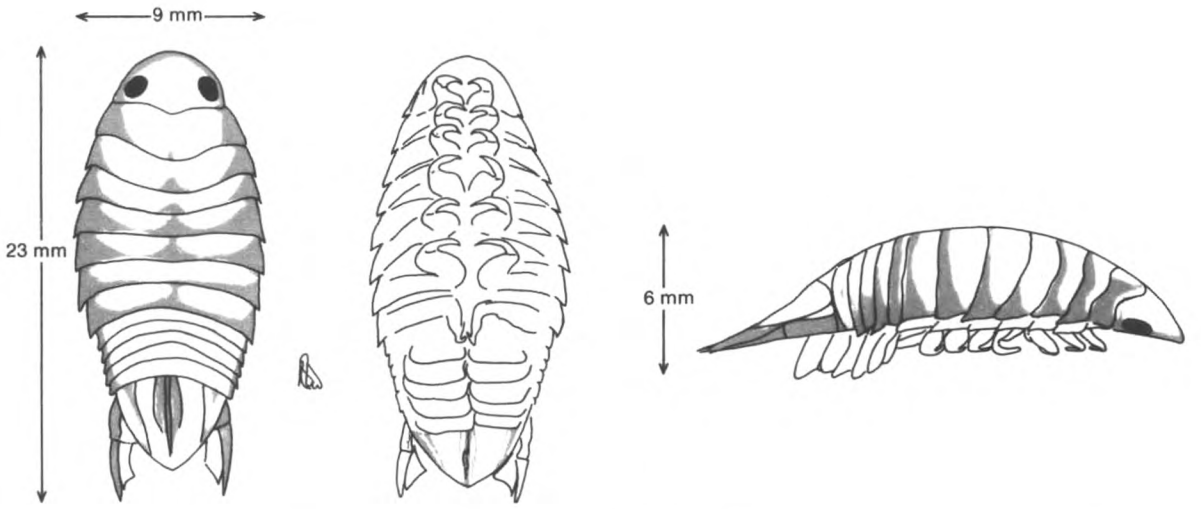
MARINE LIFE

Bass Strait

m.v. *Resolution Bay.* Captain J.H. Hutson. At anchor off Melbourne. Observers: Mr N.P. Woodhead and members of the ship's company.

13 August 1986. At about 0530 GMT whilst bottom-fishing over the stern of the ship in a water depth of 60 m, several cod-type fish were caught. As one individual was being unhooked, a small crustacean was found on it, making a meal of the tail.

As shown in the sketches, the little parasite resembled a woodlouse which has been adapted for underwater life. It measured 23 mm in length, and its segmented (twelve segments) exoskeleton was a deep red/brown colour, whilst the underside was pale flesh coloured. There were seven pairs of jointed, thoracic limbs, each having a hooked end, presumably for holding itself onto its dinner; it was, in fact, well attached to the fish at the time of capture.



It appeared to have several transparent abdominal transverse fins which were bunched together, these may have been egg pouches. On the last abdominal segment was a flat tail fin and two oar or paddle-like jointed limbs on either side. The eyes were black, although they first appeared to be a translucent grey colour, and were honeycombed (multiple lenses). The mouth parts were very small, and were not easily distinguishable, the creature had no antennae or proboscis.

This particular beast could not be identified from any books in the ship's library, needless to say, the fish was not eaten!

Position of ship: 37° 50′S, 144° 58′E.

Note. Dr F. Evans comments:

'The creature is a parasitic isopod resembling, as the observer remarks, a woodlouse. It belongs to a family called the Cymothoidae (sigh-mow-thow'-id-ee) which are parasitic on the bodies of fish. There is a reference in *The Marine Observer* for October 1978 to a related animal which infests the mouths of flying fish. [See also April 1987, p. 56.] They are often quite large, and one species, *Anilocra gigantea* is recorded as growing to 9 cm (hence the name).

'I am impressed that the observer has taken so much trouble with the specimen. The description accompanying it is very good, so good in fact, that I could have placed the animal in the correct family from the written account alone. Had the observer only known it, the foremost expert in the world on these creatures is Dr Neil Bruce in Australia, where the specimen was found!

'In the course of my enquiries, I was shown a related specimen here in the Hancock Museum in Newcastle, which was even larger than the one from the *Resolution Bay*. It was found in a tin of sardines! By the way, there is no reason for not eating the host fish, any more than beef is rejected from a cow with fleas.'

BIRDS

Gulf of Aden

m.v. *ACT 7*. Captain D. Newlin. Suez to Melbourne. Observers: Bridge watchkeepers and Mr K. Robertson, passenger.

7 July 1986. During the morning, a wet and bedraggled bird was found sheltering behind one of the forecastle winches. A box was duly prepared, into which the bird was put. It was obviously completely exhausted and did not struggle at all.

Using Tuck's *Seabirds of the World*, the bird was positively identified as a Sooty Tern. On the wings, from the body to the 'wrist', the feathers on the leading

edge were white. Its back and wings were black, but the underside of the body and wings were white. The crown of the head was black, but with a black stripe running from the eyes to the beak. The bird had a black, pointed beak and a 'swallow-tail'.

After resting on the bridge for a day, and drying out, it started to show signs of movement. We then tried to feed it. A pipette was obtained, and some sardines were mashed up. This was dribbled onto the bird's beak via the pipette and was accepted. After a few more hours, the tern was beginning to get restless, so it was decided to release it. It was launched from the leeward bridge wing, and flew off quite happily, none the worse for its experience.

Position of ship: 12° 20'N, 44° 55'E.

Note 1. Captain A.S. Young, of the Royal Naval Birdwatching Society, comments:

'This would almost certainly be a Sooty Tern (*Sterna fuscata*), the darker and largest of the dark back terns, although the Bridled Tern (*S. anaethetus*) is very similar, but decidedly smaller. The Sooty Tern is wide-ranging in all tropical and subtropical waters, and is very pelagic.'

Note 2. A photograph of a Sooty Tern found on board m.v. *Flinders Bay* on 4 July by Mr A. Kirkham, 2nd Officer, appears opposite page 128.

Indian Ocean

m.v. *ACT 8*. Captain J.A. MacLeod. Port Chalmers to Suez. Observers: Mr D.J. Smith, 3rd Officer and Mr T. Broadhead, GP Lookout.

23 August 1986. At about 1730 GMT, a medium-sized frigate-bird was seen to fly down the starboard side of the ship, from forward to aft. No more was seen or heard until 1800, when the observers were standing on the starboard bridge wing; this time, the bird approached diagonally across the bridge front, and attempted to land on the spot where the Lookout stood leaning over it.

The lookout has a bald, domed head — and the moon was up. He looked up at the flapping sound and saw the bird about 1 m above his head, with its legs and feet outstretched towards him, and its long, narrow bill opening and closing.

At this point, the Lookout took flight to the shelter of the wheel-house, narrowly beating the Third Officer through the doorway. Seeing its perch disappear, the bird banked to its left and flew aft. By contrast with the Lookout (according to the Third Officer), the bird seemed undisturbed by its experience, and during the next twenty minutes, made three further attempts to land on the starboard bridge wing, each time using the same approach path across the bridge front, but failing to complete the landing.

It was thought to be either a Great or Lesser Frigate-bird, being of overall dark plumage, but with a white chest, long and narrow pale-coloured bill, and with an estimated wing-span of about 1.5 m.

The wind at the time was SE'ly, force 5, and the ship was moving north-west at 20 knots.

Position of ship: 07° 42'S, 67° 44'E.

Note. Captain A.S. Young comments:

'Without more positive diagnostics, it is not possible to say whether this bird was a Great Frigate-bird (*Fregata minor*) or a Lesser Frigate-bird (*F. ariel*), as their ranges overlap considerably.

This would probably have been a female (hence the desire to make up to the Lookout), having a white throat and breast, the pattern of which would indicate which species it was. I do not think it would have been an immature, as they tend also to have a lighter brownish head and throat.

'As these birds cannot land on the water, the distance they fly away from land is incredible, taking all their food on the wing.'

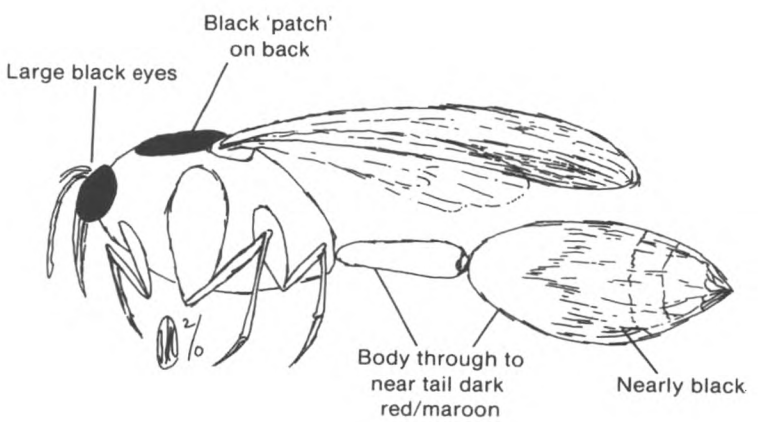
INSECT

Red Sea

m.v. *Melampus*. Captain C.A.M. Tatham. Aqaba to Aden. Observers: Mr K.I. Wilkinson, 2nd Oficer and Mr G. Laversuch, 3rd Officer.

14 July 1986. At 0700 GMT a large ant-like insect with wings was found in the wheel-house. It was aggressive towards the Third Officer when approached, and so was sprayed with an insecticide before further investigation.

The insect had two pairs of wings; the main pair being light brown, darkening towards the tips, whilst the others were translucent, and there were three pairs of legs, with the middle pair the largest, there was also one pair of antennae. The rest of the colouring was as shown in the sketch, which is approximately twice life size.



The vessel had been in Aqaba, Jordan on the previous evening, and had since steamed down the narrow Gulf of Aqaba, so the insect was thought to be of local origin and not from other ports.

Position of ship at 0600 GMT: 27° 24′N, 34° 42′E.

MOTHS

Caribbean Sea

m.v. *Irma M.* Captain R.L. Westwater. At anchor, Almirante. Observers: the Master, Mrs Jacobs, Andrew and Mark Jacobs (passengers), and ship's company.

2–4 July 1986. Whilst at anchor, hundreds of moths arrived on board during the nights of the above period, and as we were a mile from the berth, they were not eaten by birds at first light. Several photographs were taken of the moths (see photograph opposite page 128, and front cover).

Position of ship: 09° 17′N, 82° 23′W.

Note. Mr M. Honey, Department of Entomology, British Museum (Natural History), comments:

'The specimen opposite page 128 is *Xylophanes chiron* Dury (Sphingidae). Those on the front cover, from left to right are: *Rothschildta lebeau* Guérin-Méneville (Saturniidae); *Pachylia ficus* Linnaeus (Sphingidae), the Fig Sphinx; *Eumorpha fasciata* Sulzer (Sphingidae), the Banded Sphinx. All the species identified [unfortunately, it has not been possible to reproduce all the photographs here] are relatively common through Central and South America, with several species (those with common names) occurring in North America. Some have previously been recorded on ships, and others are closely related to known migratory species.

'I would like to keep the photographs please, as moths pictured in their natural resting positions are very useful.'

BIOLUMINESCENCE

North Atlantic Ocean

O.W.S. *Cumulus*. Captain G.F. Kay. At station 'Lima'. Observers: Mr N. Cummins, 1st Officer, Mr M. Hatch and Mr G. Sans, Meteorologists.

23 September 1986. At 0445 GMT, during a routine weather observation, a number of lines on the sea surface were noticed, they appeared to be moving, and gave off a pale green light. One of the lines then passed close to the ship, revealing an adult Common Dolphin with a green trail which extended some 5 m behind it. The trail was assumed to be a type of bioluminescence activated by the movement of the dolphin. Five dolphins were counted as they swam around the ship and created the effect of drawing on the sea with their green trails. The display given was one which even Mr Hatch, with twenty years' ocean weather ship experience, had not seen before.

A sea-water sample was taken and tested by shaking it and shining a torch on it, but little, if any luminescence could be seen. Later, when the main engine was started, the green effect could be seen again, caused by the action of the prop. There was another sighting of the green dolphin trails on 26 September.

Weather conditions at the time of observation were: air temperature 12.8 °C, wet bulb 12.6, sea 12.7, pressure 1018.9 mb, wind SW'S, force 4.

Position of ship: 56° 47'N, 20° 11'W.

Note. Dr P.J. Herring, of the Institute of Oceanographic Sciences, comments:

'The dolphin trails sound most dramatic. Dinoflagellatges were the cause of the luminescence. I have seen similar effects in the Strait of Gibraltar, and regard them as one of the most spectacularly beautiful sights at night.'

South Atlantic Ocean

m.v. *La Pampa*. Captain D.K. Smith. Narvik to Cigading. Observers: Mr J.D. Robinson, Chief Officer, Mr C.M. Bates, 3rd Officer, Mr M. Awad, SG1A and Mr C. Watts, SG1B.

29 July 1986. At about 1745 GMT bioluminescence was observed in the disturbed water along the ship's side and in the wake. This took the form of small flashes of white and green against a whitish background glow. Occasionally, larger 'lumps' could be seen, and these ranged in diameter from about 2.5 cm to about 30 cm.

Shortly after the first sightings, extremely pale bands were observed running in an east/west direction. These were not regular, having the appearance of windrows of spume on the surface, but were about 20 m apart, 1 m wide, and

roughly 1–2 m below the surface. The phenomenon was not affected by turning the radar and echo sounder on and off. However, the bands were affected by playing the Aldis lamp beam on them, responding after a second or so with a flash of more intense luminosity. By moving the Aldis beam quickly along the bands, the responsive 'flash' travelled along them allowing it to be seen probably up to 0.5 n.mile away. Only very occasionally were fish eyes seen.

The bands faded shortly after 2000, and the luminescence along the ship's hull ended abruptly at 2110. No odour was detected.

Weather conditions were: air temperature 24.3 °C, wet bulb 19.2, sea 23.8, wind SE'ly, force 3, sky clear and dark. Ship's course 140°, speed 14.0 knots.

Position of ship: 06° 51′S, 04° 18′W.

Note. Dr P.J. Herring comments:

'As the observers suggest, the bands were probably windrows, and the luminous "lumps" were probably jellyfish or comb jellies. The effect of the Aldis lamp suggests that the responsive organisms were small crustaceans, either copepods or ostracods, both of which are known to respond to a searchlight illumination with a responding flash or glow.'

South Atlantic Ocean

m.v. *Esplanade*. Captain G.D. Sandercock. Dalrymple Bay to Hunterston. Observers: Mr I.Cowan, 3rd Officer, Mr C. Gray, Chief Engineer Officer and Mrs A. Jackson.

25 August 1986. At about 2100 GMT, bioluminescence was observed down the ship's sides and in the wake. At first, it had only a milky appearance, but became bars of light of approximately 30 cm by 10 cm, passing down the side, and giving off a steady light. These bars were not in line, but lay in various directions. Larger, bright patches were seen deeper down, and there were other patches apparently rising to the surface and 'exploding'.

Later, at around 2200–2215, bands of light were seen to port (only), about 0.5–1.0 n.mile off while parallel to the ship's course. It was not possible to tell if these bands were moving. After 2215, the bands were left astern, but the bars were still passing down the ship's sides. A few samples of sea water were taken, but no light was visible even when shaken; unfortunately, there was no provision on board for preserving samples.

A searchlight was directed into the water beyond the lit areas, and this produced small, bright spots of light varying in colour from bright yellow/orange, to a bright, vivid red. These spots appeared to dart around, sideways, fore and aft, although the general flow was astern.

The effect returned to a light, milky appearance at about 2240, with only occasional bars of light around the vessel.

Weather conditions at the time were: wind SSE'ly, force 3, cloudy sky, no moon, sea temperature 23.5 °C. Course of ship 322°, speed 13.3 knots (r.p.m. for 12.6 knots).

Position of ship: 06° 43′S, 04° 06′W.

Note. Dr P.J. Herring comments:

'The bands of light were probably accumulations of near-surface organisms collected into windrows, but they must have been stimulated by the activities of other animals. The shorter "bars" of light were presumably *Pyrosomas* at some depth below the surface, and the effects of the searchlight would have produced red and yellow eyeshine in lanternfish at the surface.'

ABNORMAL REFRACTION

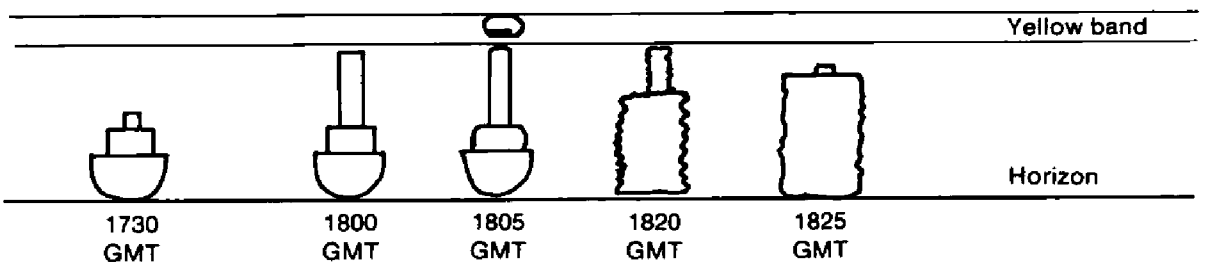
Mediterranean Sea

m.v. *Esso Demetia*. Captain I.D. Grigor. Sidi Kerir to Rotterdam. Observers: Mr K.H. Milne, 1st Officer and Mr R. Duff, Radio Officer.

22 August 1986. Between 1800 GMT and 1940 GMT abnormal refraction in various forms was observed.

At approximately 1600, a low, yellow-coloured sand layer was observed, originally thought to be haze or fog. It was at an altitude of 1° above and round the whole horizon, and presented a false horizon.

At 1800 a container vessel of about 50 000 tonnes was observed ahead at about 13 n.mile by radar. Its funnel had a large vertical extent to some three times the vessel's height, with an inverted image above it, see sketches. Four other vessels at a similar distance off were seen to be affected by a similar phenomenon.



This vision was continuous for some forty minutes, and as the vessel's distance increased to 18 n-mile, so the image altered, until at approximately 1830, as the sun was just above the horizon and setting, the initial shape of the vessel had changed to a rectangular one, still with the large vertical extent, but without the inverted image.

As the sun set, so the phenomenon dissipated. Other vessels at closer distances were not affected by refraction.

Weather conditions at the time were: air temperature 25.5 °C, wet bulb 20.2, pressure 1010.5 mb falling, wind SW'ly, force 2–5, visibility 20 n.mile, the sea temperature had decreased from 20.0 to 15.0 between 1600 and 1700, then increased to 18.0.

Position of ship: 36° 06'N, 04° 42'W.

NOCTILUCENT CLOUDS

North Atlantic Ocean

f.p.v. *Jura*. Captain S.S. Lockhart. Fishery protection duties, north-west approaches. Observers: Mr J. Barkess, 1st Officer and Mr H.Kelly, Seaman.

2 July 1986. Noctilucent clouds were first noticed at 0120 GMT, and the sketches, made at 20-minute intervals until the display ended at about 0205, show their appearance. The display consisted of types II and IV clouds (bands and whirls) as defined in the *Marine Observer's Handbook*. Above altitude 20°, the clouds were silver/grey in colour, whilst below 20°, they were silver/cream.

Photo. by Skyfotos Ltd

Harold La Borde **(Bibby Line Ltd) Captain J.S. Gavin**

Photo. by Fotoflite

Remuera Bay **(P. & O. Containers Ltd) Captain W.C. Carruthers**

Photo. by Skyfotos Ltd

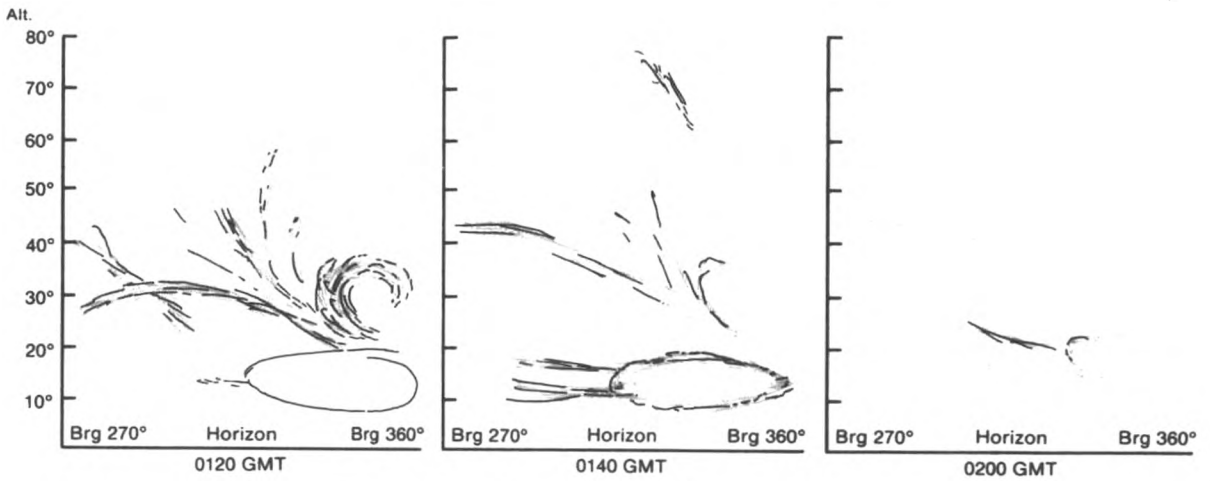
Ravenscraig **(Bibby Line Ltd) Captain T. Armstrong**

THREE OF THE SHIPS WHICH GAINED THE HIGHEST MARKS FOR THEIR METEOROLOGICAL LOGBOOKS DURING 1986 (*see* page 90).

Opposite page 113

Nurse Shark hooked from
m.v. *British Ranger*.
(*see* page 106.)

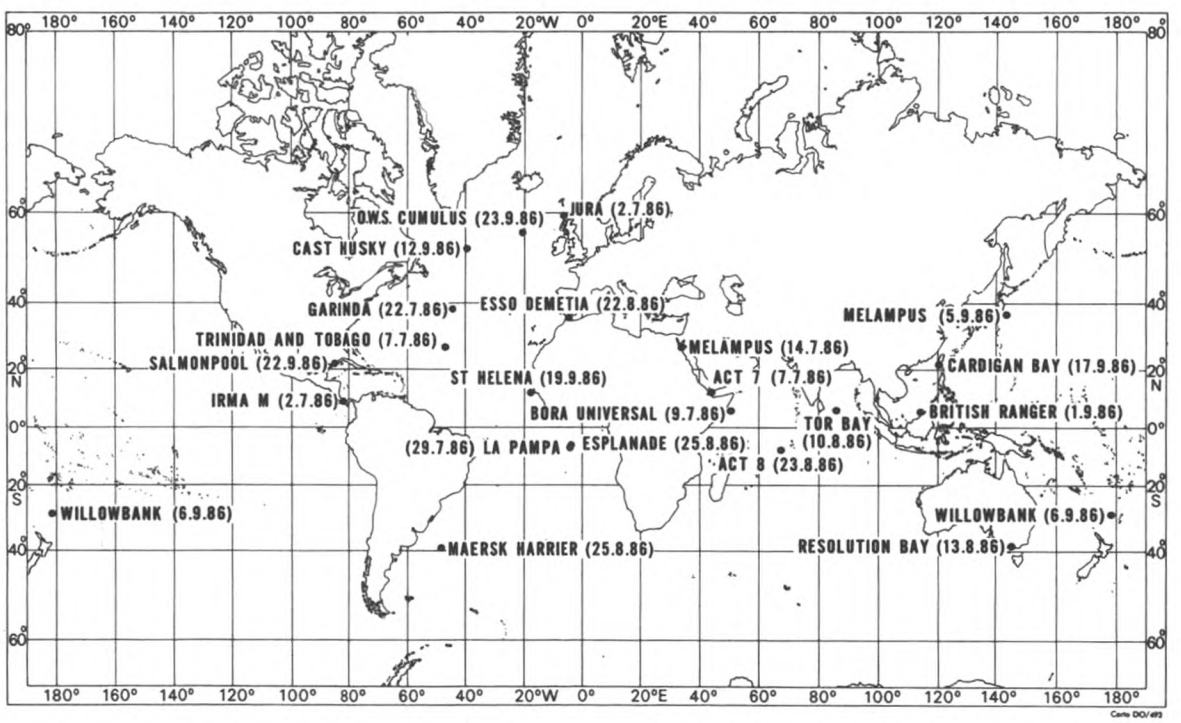
Wahoo caught from
m.v. *Trinidad and Tobago*.
(*see* page 105.)



The sky was otherwise cloudless except for traces of altocumulus and cirrocumulus in the north-western sky, which developed and dissolved before, during and after the display.

Conditions at the time were: air temperature 12.8 °C, wet bulb 11.6, pressure 1019.6 mb, wind SE'ly, force 4.

Position of ship: 59° 11'N, 05° 40'W.



Position of ships whose reports appear in *The Marine Observers' Log*

AURORA BOREALIS

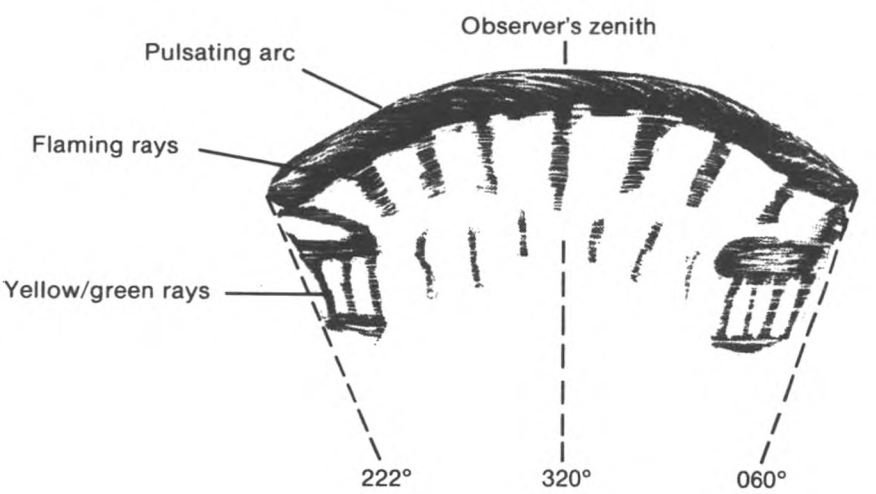
North Atlantic Ocean

m.v. *Cast Husky*. Captain E. Williams. Antwerp to Montreal. Observers: Mr R.F. Gribben, 2nd Officer and Mrs Gribben.

12 September 1986. At 0400 GMT an auroral display commenced. There was active flaming to the zenith, obscured at its lower elevation by cloud. The display

was bright, pale grey, and took the form of multiple arcs moving upwards towards the zenith, like ripples. The bearing of the display was between 270° and 030°. The following observations were made as the display progressed.

Time (GMT)	Remarks
0412	Rayed arc bearing 220°–250°, lower elevation 35°, upper edge 50°. Bright.
0416	Very clearly defined arc, upper edge brilliant white at the zenith. Bearing 000°–220°, pulsating on inside of arc towards Pole. Eastern and western extremities flaming. Bearing 000°–060°, rays of moderate brightness streaking from elevation 40°–80°.
0418	Stationary arc with rays converging towards the horizon in direction 320°. Upper edge brilliant white at zenith, with yellow/green colours flaming at eastern and western extremities, lower edge varying as rays flame towards the horizon, see sketch.
0430	Upper edge less well-defined, generally diminishing in brightness, no colours forming, breaking into individual rayed bands, like curtains opening and closing.



0418 GMT

The display disolved by 0442, by which time the sky was becoming overcast. Position of ship: 53° 25′N, 39° 45′W.

(*See* report from o.w.s. *Cumulus* on page 110.)

551.463:551.465.755

The following article is being published in two parts, the second of which will appear in the next edition of *The Marine Observer*, in October.

Phenomenon on the sea surface, as studied from visual observations*

By K.N. Fedorov and A.I. Ginzburg

In recent years, the rapid development of equipment and methods for studying the sea from space has led to a revival of interest in sea-surface phenomena. Particular interest attaches now to specific phenomena which are due to optical and other kinds of contrast, caused in one way or another by processes occurring well below the surface (lit.: in the water-mass). But there is a remarkable tendency to assume that before the arrival of aerospace data, oceanologists knew virtually nothing about the complex and varied phenomena taking place on the sea surface. At the same time, an enormous amount of valuable information about anomalous surface phenomena such as suloy†, the sea surge, slicks, eddies and whirlpools, internal wave manifestation, current divergence lines, foam and debris accumulation lines, discoloured patches, illumination of the sea, etc., is to be found in oceanographic literature from the first half of this century [4, 14, 17, 18, 20], and also in the logbooks from naval and merchant vessels, as well as those which are being published and re-published still today. These sources contain not only interesting descriptions of the phenomena which interest us, but also sketches, photographs, accurate indications of position, descriptions of the weather conditions in which the observations were made; and some sources even contain information on the infrequency of phenonema as related to season, tidal phase, and other conditions. Though a certain subjective ingredient is present in ship records, detailed descriptions always help the expert to elucidate the true nature of the phenomenon. On the other hand pilot books contain only objective information, which has been checked many times and can be relied on.

Now that ocean-going ships (including the scientific research ships) are large, automated, and less dependent on weather conditions, the anomalies in the sea surface are by no means always recorded in the logs. Hence, observations by merchant shipping officers made around the middle of this century, when records were kept regularly, are of particular interest. Invaluable work was done here by the quarterly journal of the marine section of the weather service of Great Britain, *The Marine Observer* (TMO), published from 1924 onwards. It publishes carefully-selected and frequently annotated (lit.: commented) excerpts from the logs of ships doing voluntary marine observation work *en route*. We

* Reproduced from *Okeanologiya* 1/1986(XXVI), pp. 5–14.

† Suloy. A short entry in the *Soviet Encyclopaedia* (1976) may be of interest.

'Suloy, a kind of turbulence or agitation on the sea, where wave and vorticial motions are combined on the surface. The motion of the water particles then resembles that on the surface of boiling water. Suloy occurs as a result of sharp change in the velocity of the current (particularly a tidal current) leaving a narrow passage or promontory, or from the meeting of two currents. The waves occurring in a suloy are steep, and reach heights of 4 metres in some regions (such as Arctic littorals, firths, or bays into which large (lit.: powerful) rivers are flowing) and are a danger to the navigation of small ships.'

analyzed more than 350 papers about surface phenomena, published in the journal over the 37 years 1935–37 and 1952–83. (The issues for 1924–34 and 1940–51 were not available in the libraries.) From all these papers, we selected 283 observations as being of particular interest. We give below the preliminary results of this analysis.

The surface phenomena which drew our attention can be classed into four categories.

1. Isolated bands and patches of anomalously turbid water, more intense turbulence, crests and surges or, conversely, isolated (individual) smoothed areas of sea surface (most frequently with orientation indicated), quite often accompanied by change in water temperature, with the ship yawing etc.
2. Isolated lines of separation or 'demarcation' (with orientation indicated), expressed by change (variation) in colour, sharp change in water temperature and debris or foam accumulation.
3. Isolated bands, areas with various shapes and separation lines (curves) (with orientation [in space] indicated) combining in themselves various components from paragraphs 1 and 2, plus whirlpools, eddies, sonar phenomena, and accumulation of plankton organisms (sometimes luminous ones) and also marine animals and birds; these being observed frequently during complete calm, and against a background of tranquil sea.
4. Multiple alternating parallel bands of ripples, surges, or intense turbulence and more tranquil water (or slicks) accompanied by yawing of the ship where the band boundaries cross (meet), with orientation of bands indicated.

While paragraphs 1–3 contain information mostly regarding surface phenomena of frontal sections of various kinds, the information in paragraph 4 is univocally interpreted as visible phenomena which are manifestations of internal wave trains on the sea surface, sometimes occurring because of fronts. (Alternating bands of slicks and ripples were interpreted as surface manifestations of internal waves for the first time, apparently, by Ewing in 1950 [13]). Category 3 is concerned with a phenomenon usually called (?) whirlpool (swift current) (Russ: suloy) in dictionaries and manuals [4, 5]. We should note (certain) terminological difficulties encountered in using TMO. In the headings under which the papers appear (titles), and also in texts by the observers themselves, at least for the three categories of information in paragraphs 1, 3 and 4, the same English names are used: rips, current rips, tide rips, disturbed water, rough water, choppy water etc. The first three names (terms) are exact English equivalents of the Russian 'suloy'; the other three correspond to 'tolcheya' (surge). The information was divided up four ways as above, only on the basis of detailed descriptions, and not (just) from the titles or terms used by the observers.

From the data we obtained from TMO (1935–83) and its division into several (such) categories, we can explain, albeit only roughly, the prevalent types of anomalous phenomena on the sea surface, and understand (realize) the extent to which one or other surface phenomenon is affected by coasts (shores), narrows, islands, sea-bed relief and general (or total) sea-water circulation components. Table 1 gives the total number of observations n_i in each category ($i=1, \ldots, 4$) and the distribution of observations over the 'shallow water' ($H<500$ m) and 'deep water' ($H>500$ m) aquatorials. Of course, this kind of statistic is going to be

biased (lit.: conditional) owing to the known preference for merchant shipping lanes, so that considerable sectors of the Pacific Ocean were not covered by any observers at all. Even so, we have no other data for generalization, of this kind, at our disposal.

Table 1 — Distribution of observations over the different categories

Category of phenomenon (i)	n_i	$n_i = k_i + m_i$		n_i/N (%)
		k_i(H<500 m)	m_i(H>500 m)	
1	97	18	79	34
2	78	24	54	28
3	32	8	24	11
4	76	30	46	27

$N = n_i = 283$

It follows from Table 1 that most of the observations (73 per cent) relate to various kinds of frontal phenomena, including suloy (whirlpool, swift current). The fronts in category 2 occur mostly (42 per cent) because of the main currents (Gulf Stream, Kuro-Siwo, Falklands, etc.). Upwelling regions account for about 23 per cent, estuarial sectors for 8 per cent, and the proportion of category 2 fronts accounting for 'deep water' aquatorials reaches 69 per cent. The frontal phenomena of category 1 are also met with, and more often (82 per cent of cases), in deep water, and particularly often in upwelling regions, where there is great fluctuation (variability), meandering, and current convergence. About 40 per cent of the observations of this type of frontal phenomena are accounted for by the Red Sea, the Aden–Somali region, and the Indian Ocean as a whole.

A comparatively small number (32 cases) of indisputable observations of suloy make up only 11 per cent in all of the total number of papers taken. Of these, 8 (i.e., 25 per cent) are for shallow water (including 5 for straits (sounds, channels)). Most of the suloys (whirlpools etc.) were recorded at points of convergence (confluence) of currents.

The very small number of papers on observation of the suloy is explained by the fact that (the) sailors usually recorded unusual (anomalous) phenomena only in those cases when their occurrence was unexpected. The suloys which were well described in the pilot books (manuals) and appeared regularly in the White Sea, the Kuril Strait (channel), or the region of the Aleutian Islands salient were not, as a rule, recorded by sailors in ships' logs.

Surface manifestations of internal waves occurred roughly as often in shallow water (40 per cent), as where the total depth is more than 500 metres (60 per cent). In 30 per cent of the cases, they were recorded close to islands, banks, and underwater ridges (22 observations); in 8 per cent of the cases, in channels (straits); 4 per cent of the observations relate to estuarial sectors, while the rest are around upwelling regions, the shelf boundary, and where currents meet.

Figure 1 shows the geographical distribution of all the cases of surface phenomena listed; the conventional signs for representing the phenomena of the four types were placed so as to represent the orientation of the bands being observed relative to the countries of the world. Where some phenomenon or other is (was) observed repeatedly, this is indicated with a word. The map also gives information about small vortices, eddies, and suloys in the coastal regions of the Sea of Okhotsk, Bering and White Seas, the Sunda Archipelago seas, the

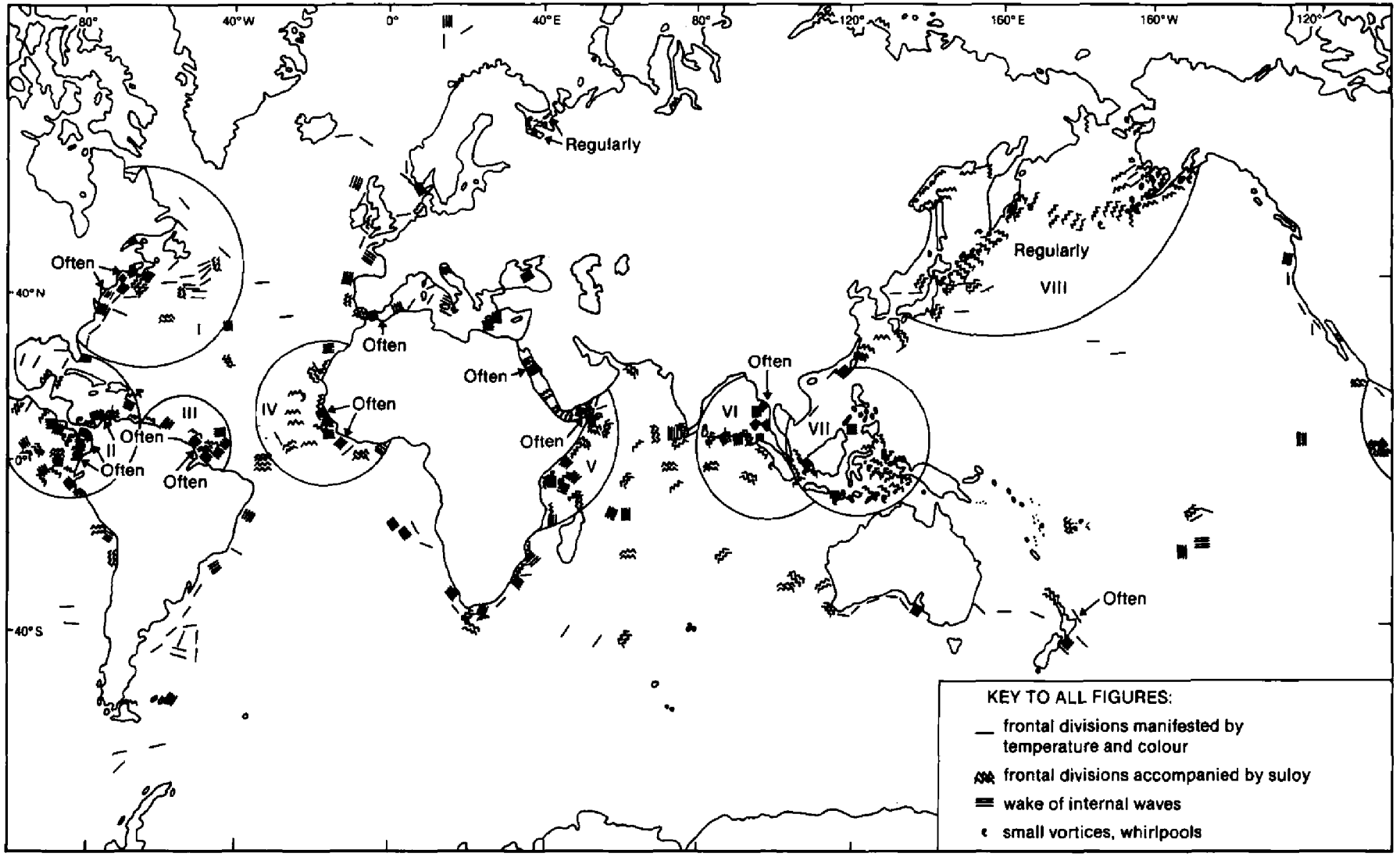


Figure 1. Phenomena on sea surface, from TMO data, pilot books, papers [1, 2, 4, 6, 9, 14, 16, 20] and from remote observations.

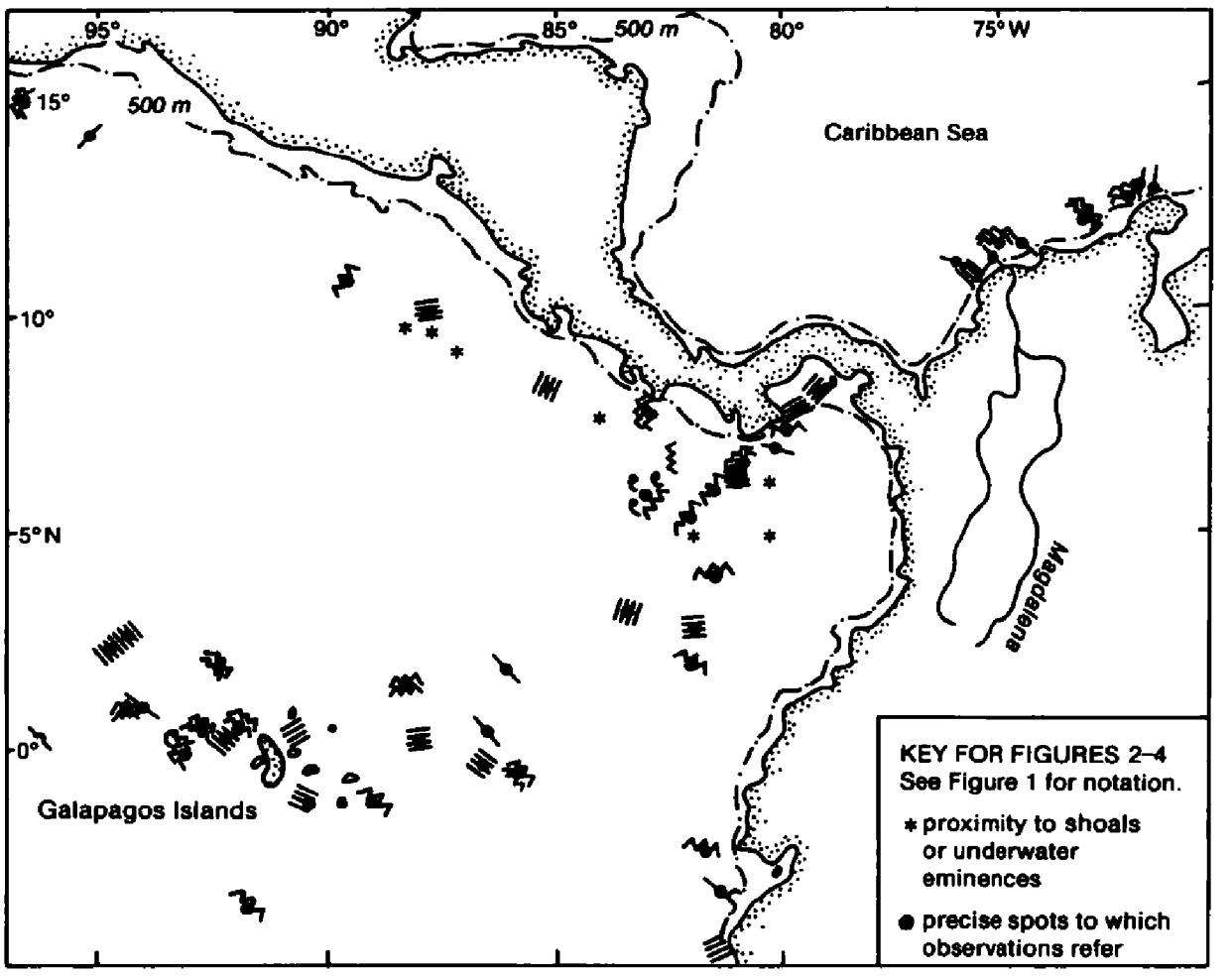


Figure 2. Panama–Galapagos and Caribbean regions.

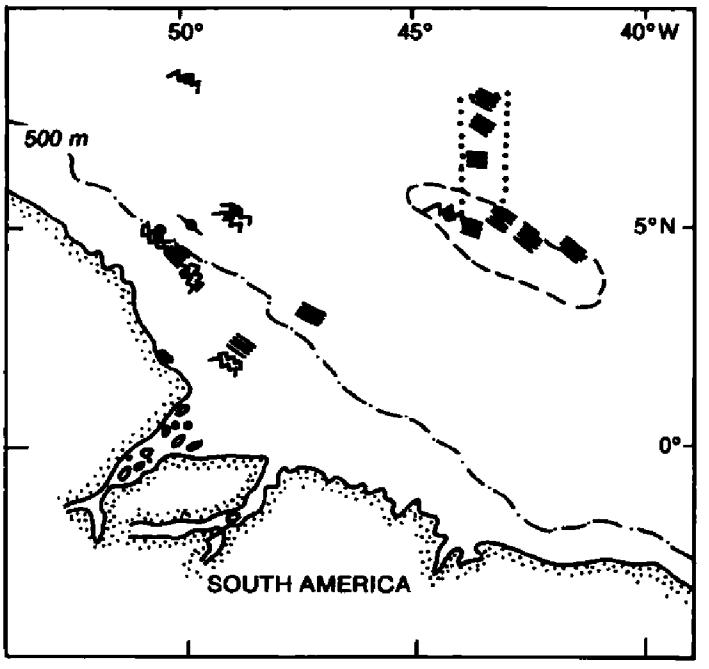


Figure 3. Region of influence of the River Amazon.
KEY: position of the Demerara eminence.
region where the *Academician Vernadskiy* operated [6].

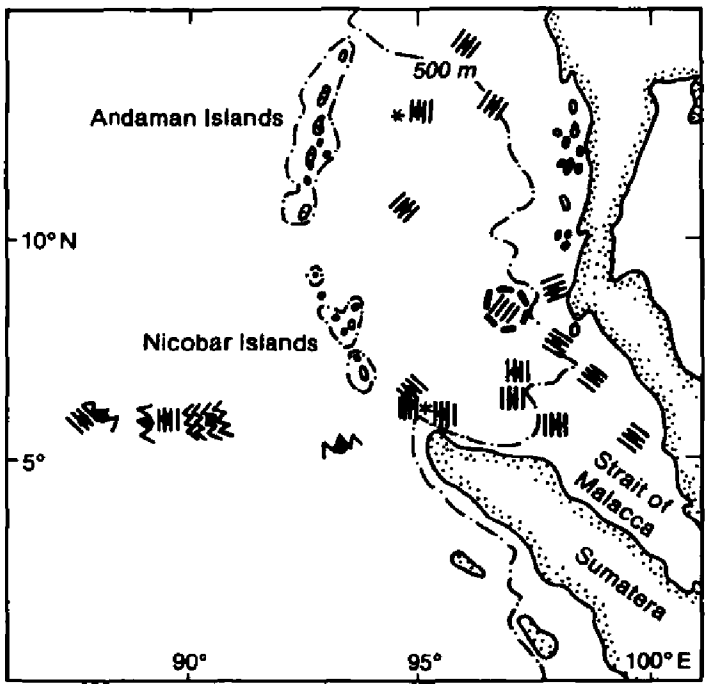


Figure 4. Region of Andaman Sea and Bengal Strait. Dashes show where internal wave solitons were photographed during the 'Soyuz–Apollo' Soviet–American experiment.

east coast of Africa, and Caribbean Sea, and Gulf of Mexico, obtained from pilot books for the corresponding regions and a number of papers [4, 9, 14, 20]. Moreover, real-life (actual, full-scale, life-size) data were used to make the map [1, 2, 6, 15, 16], as well as results ascertainable from the literature on remote observations of surface manifestions of internal waves and oceanic (marine) fronts.

The general conclusion to be drawn from Figure 1 is very much like that about the frequency of thermal fronts at sea, drawn from ship measurements of surface temperature [3]. Surface phenomena of all four categories are much more often met with close to the littorals than out at sea.

In Figure 1, we can distinguish the following regions where the most frequent observations of anomalous conditions (states) in the sea surface are concentrated, without separation into categories: I — northwest Atlantic; II — Panama–Galapagos and Caribbean regions; III — region of influence of the rivers Amazon and Orinoco; IV — west African region; V — Aden–Somali region (including the Red Sea); VI — region of the Andaman Sea and Bengal Strait [Pulau Wé]; VII — Sunda Archipelago region; VIII — north-west Pacific Ocean (including the Sea of Okhotsk, Bering Sea, Kuril and Aleutian Islands salients).

The most interesting of the phenomena considered occur in sectors of regions II, III and VI, and these are represented by separate maps on larger scales in Figures 2–4 respectively.

551.515.1

A new North Atlantic low pressure record*

By S.D. Burt

On 14/15 December 1986, the explosive deepening of a very active depression between Greenland and Iceland resulted in the central pressure falling below 920 mbar. As far as can be ascertained, this is the lowest barometric pressure known to have been recorded in the North Atlantic Ocean, and very possibly the lowest in the world outside of tropical storms (and possibly the centres of violent tornadoes).

The synoptic situation at midnight GMT on 15 December is indicated on Figure 1, together with the track of the storm and central pressure at six-hourly intervals since its formation off the south coast of Newfoundland during the afternoon (GMT) of 13 December. The depression formed as a vigorous wave on the polar front which lay 100–200 km off the coastline of Nova Scotia and Newfoundland in an exceptionally pronounced thermal gradient. At 1200 GMT the air temperature on the Nova Scotia coast (about 46° N 60° W) was about −7 °C; 1000 km to the north-east, in interior Québec, temperatures were below −20° on the edge of an intense anticyclone (1041 mbar) over the Great Lakes, while 1000 km to the south-east a ship at 39½° N 52° W reported +21°. By 1800 GMT that day Low W was identified as a closed isobar on an open wave at about 42½° N 53½° W, with a central pressure of 986 mbar. Also on the chart at this time was Low V at about 52° N 47° W (slightly more than 1000 km to the north-east). This was in a slightly more advanced state of development, having formed about 18 hours earlier in the Gulf of St Lawrence in a similarly-pronounced thermal gradient, with a central pressure about 978 mbar at this time. During the subsequent six hours Low W moved very rapidly north-east (covering some 530 nautical miles, 980 km, an average speed of almost 90 knots) while Low V moved less rapidly east-north-east on a converging course. At midnight on 14 December Low W lay near 47° N 43° W with a central pressure about 970 mbar. Over the next six hours it continued its rapid north-eastward movement, albeit at a slightly slower rate, covering about 400 naut. mi. (740 km) to give an average speed of about 67 knots. By this time (0600 GMT) the depression was the major feature of the North Atlantic chart; the central pressure was about 956 mbar (at about 52° N 36½° W) and occlusion had begun. At this time Low V was still shown as a separate feature at 54° N 40° W (with a central pressure of 960 mbar) but soon became absorbed into the circulation of Low W. There can be little doubt that the absorption of another vigorous feature into what was already a mature depression resulted in considerable invigoration of the system, for over the next six hours the depression deepened explosively (26 mbar): it is noteworthy that this was twice the rate before the incorporation of Low V into its circulation.

Over the next six hours the by-now combined system continued to move quickly (covering about 300 naut. mi., 560 km, an average of 50 knots) but the

* Reproduced from *Weather*, **42**, February 1987 by kind permission of the Editor.

course was turning all the time from north-east to a more northerly track. At 1200 GMT the depression was centred about 56½° N 33° W with a central pressure of 930 mbar; ship EFMA at 56° N 29½° W reported a pressure of 938.8 mbar, and a wind of south-easterly 60 knots. At 1800 GMT its central pressure was about 920 mbar, centred about 59½° N 35° W, and the depression was now moving north-north-westward. Over the previous six hours it had covered about 185 naut. mi. (340 km) and thus averaged about 31 knots, but after 1800 the depression slowed to only a few knots. At 1800 GMT ship UYIR at about 61½° N 33½° W reported a pressure of 926.2 mbar, having fallen 19.1 mbar in the previous three hours. At midnight 15 December the same ship (now about 61° N 37° W, some 100 naut. mi., 195 km, from its position six hours earlier) reported 920.2 mbar; the reported wind was north-easterly 60 km, and thus it seems likely that the ship was still some distance from the centre of the depression. The British Meteorological Office assessed the centre of the depression to be about 916 mbar at this time (Fig. 1), but the West German meteorological service enclosed the depression with a 915 mbar isobar, indicating a pressure possibly as low as 912–913 mbar.

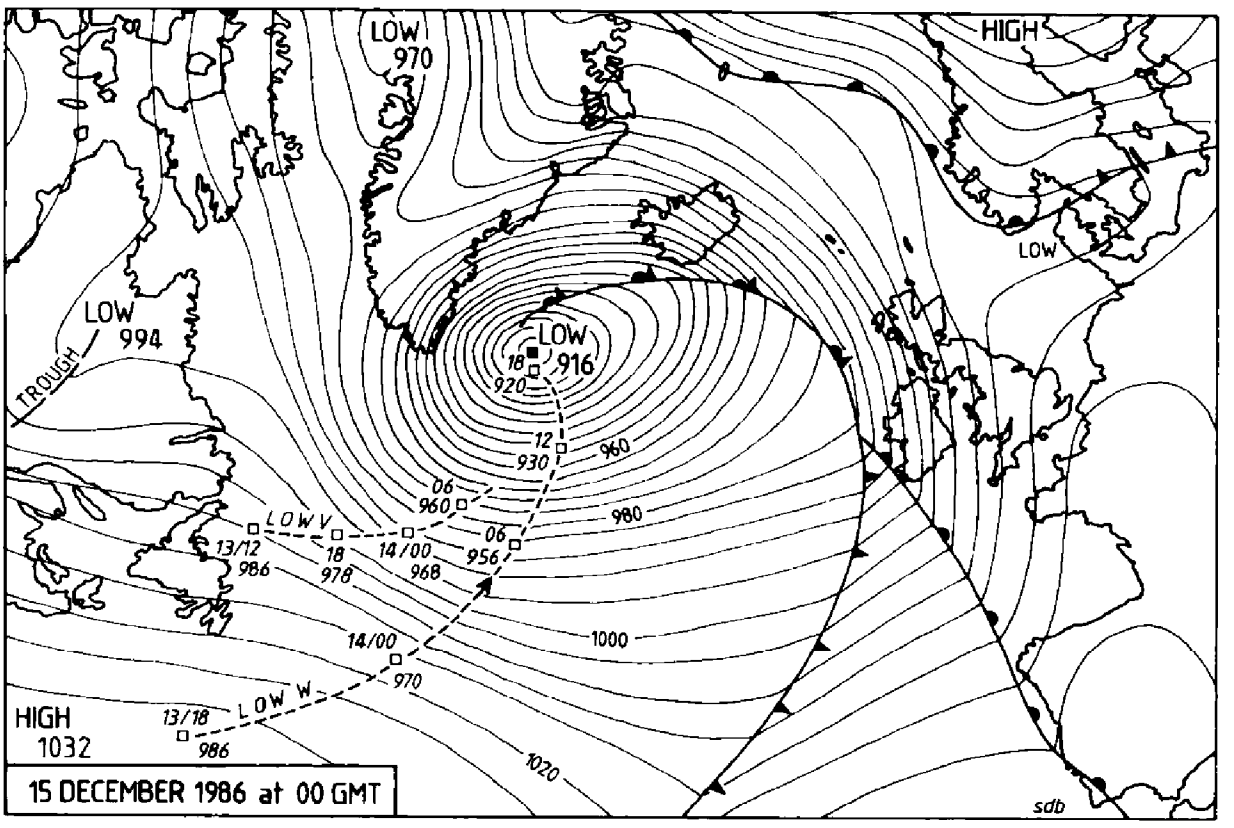


Figure 1. Atlantic surface analysis at 0000 GMT on 15 December 1986, showing depression track (Low W) and central pressure (mbar) during the preceeding 30 hours. The track and central pressure of Low V until incorporation with Low W is also shown (see text). The isobars are drawn every 4 mbar.

After midnight the centre of the depression executed a small loop (probably as a result of coming up against the mass of cold air over Greenland) and returned south-eastwards for a few hours before moving slowly north-east once more. At 0600 the depression centre lay near 61½° N 30½° W with a central pressure of 920 mbar; a buoy at 62° N 33° W reported 926.6 mbar at this time, confirming the exceptional depth of the depression. At 1200 the depression was almost

stationary at 61½° N 31° W, central pressure 930 mbar; a buoy at 62° N 32° W reported 932.3 mbar. Winds on the southern and western edges of the storm were strongest at this time, with north-westerly 75 knots reported from a ship at 61½° N 38° W and west-south-westerly 70 knots (accompanied by a heavy sleet shower) from another ship at 55½° N 30° W. At 1800 GMT 15 December the centre lay near 62½° N 29½° W, at 936 mbar, slow-moving and filling slowly.

Previous deep depressions in the North Atlantic

The ship report of 920.2 mbar at midnight GMT 15 December is, as far as is known to the author, the lowest documented barometric pressure recorded anywhere in the North Atlantic, while the extreme depth of the depression, about 915–916 mbar at its lowest, would also seem to be without parallel. Pressures below 935 mbar are uncommon, but that been recorded on a number of occasions. The lowest known observation prior to 15 December 1986 was one of 921.1 mbar on the ship *Neier* at 49° N 26° W on 5 February 1870 (*Shipping Gazette*, 9 February 1870, as reported in *Q.J.R. R. Meteorol. Soc.*, **28**, 1902, pp. 39–40), accompanied by 'a most violent hurricane from west-south-west to west-north-west for six hours ... ship hove to for five hours' (and thus the ship may have been some distance from the centre). The value is supported by the observation of 925.5 mbar on board HMS *Tarifa* at about 51° N 24° W (Marriott 1884, p. 121) 'by a standard barometer, fully examined and believed to be correct'. At Reykjavik, Iceland, 924 mbar was recorded on 4 February 1824 (Meteorological Office 1975, p. 59). The lowest barometric pressure on record for the British Isles, 925.6 mbar at Ochertyre, near Crieff in Perthshire, was recorded on 26 January 1884 (Marriott 1884) as a deep and still deepening depression moved north-east across Northern Ireland and central Scotland at about 25 knots.

At Belfast 927.2 mbar was recorded during the passage of a low that probably deepened to just below 924 mbar over Northern Ireland on 8 December 1886 (Harding 1887). A pressure of 925.5 mbar was reported from SS *Westpool* in the Atlantic on 4 December 1929 (*Meteorol. Mag.*, **68**, 1933, p. 18). On 3 January 1933 a very deep depression crossed Iceland from south to north; at 07 h the pressure at Reykjavik was 927.2 mbar, and it was thought likely it had been lower earlier (*Meteorol. Mag.*, **68**, 1933, p. 18). On 28 November 1838 the barometer at Limerick in south-west Ireland fell to 931.2 mbar (Rohan 1975). On 19 December 1945 a depression moving north and then north-west between Ireland and Iceland deepened to about 927 mbar; at Valentia the lowest recorded was 948.6 mbar at midnight 18/19th. On 27 October 1952 a vigorous depression about 53° N 18½° W was suggested to have been about 922 mbar (Lewis 1983) although on examination of contemporary records a value of 935–936 mbar seems more probable. The lowest pressure on record at Ocean Weather Station *Lima* (59° N 19° W) between 1961 and 1970 was 931.1 mbar at 01 h on 16 January 1962. On 10–11 January 1974 a depression deepened to 934 mbar at about 56° N 22½° W (north-west of Ireland). On 19 December 1982 a depression of about 931 mbar lay at 58½° N 15° W (between Iceland and Ireland); as it continued to move west, it caused the pressure to fall to about 936 mbar over the extreme north-west of Scotland during the night of 19/20 December (Burt 1983), the lowest barometric pressure recorded in the British Isles this century. Only two weeks later, on 5 January 1983, Low U deepened to 930 mbar just south of Iceland. On 26 December 1983 a depression of 936 mbar was centred off the

south-east coast of Greenland, to be followed by another of 940 mbar off northern Norway on 1 January 1984, another of 938 mbar north-west of the Hebrides on 2 January and another of the same pressure again just south-east of Greenland on 4 January. On 27 November 1984 Low N slow-moving to the north of Iceland was about 937 mbar.

Perry (1983) reproduced a map of the lowest surface-level pressures known to have occurred over the North Atlantic over the period 1931–65. Only the area south-west of Iceland was credited with pressures below 930 mbar, with a small closed isobar indicating 925 mbar or less centred about 60° N 20° W. It is probable, of course, that modern communications and observational networks are far more likely to pin down the position and depth of such extreme depressions than would have been the case even half a century ago, but against this has to be offset the fact that increasing air traffic has resulted in the North Atlantic shipping routes being less busy than they were at that time.

A comparison with planetary extremes of pressure

It would seem that reliably documented barometic pressure of 920 mbar and below have, until this event, been confined entirely to the centres of particularly vigorous tropical storms. Lowest on record anywhere in the world is the 870 mbar recorded by a USAF aircraft dropsonde in the eye of typhoon *Tip* some 500 km west of Guam at 16° 44'N, 137° 46'E on 12 October 1979, and there are a handful of other occurrences below 900 mbar on record — for instance 877 mbar at 19° N 135° E in the eye of typhoon *Ida* on 24 September 1958, 886.6 mbar on 18 August 1927 on the Dutch steamship *Sapoeroea* about 750 km east of Luzon in the Philippines (*Nature*, 18 August 1928, p. 251), and 892.3 mbar at Matecumbe Key in Florida during the famous 'Labor Day hurricane' of 2 September 1935 (Ludlam 1982). However, the lowest recorded pressure in the contiguous United States (i.e. excluding Alaska and Hawaii) outside of a tropical storm has been 954.9 mb at Canton, New York state on 3 January 1913, equalled at Block Island, Rhode Island on 7 March 1932 (Ludlam 1962) while the lowest on record at Gander, Newfoundland between 1942 and 1971 was 946.3 mbar on 9 February 1964 (Ludlam 1971). The lowest on record for New Zealand is 954 mbar at Taiaroa Head, Otago Peninsula on 16 January 1939, although 945.1 mb was recorded at Campbell Island (52° S 169° W, almost midway between New Zealand and Antarctica) on 18 July 1982 (Collen 1983), the lowest at that site since records commenced in 1941. In the South Atlantic the lowest recorded pressure at Grytviken on South Georgia (54° 16'S, 36° 30'W) in 36 years 1929–64 was 942 mbar (Meteorological Office 1967), while the lowest in a fairly long record at Stanley, Falkland Islands was about 955 mbar (Crewe and Burt 1982).

In conclusion, it is suggested that the depression that deepened to about 915–916 mbar at midnight on 15 December 1986 was the deepest on record for the North Atlantic, and very probably for any temperate latitude. If any readers know of any deeper depressions outside of tropical storms, perhaps they would provide further details.

Acknowledgement

My thanks go to the Meteorological Office for providing copies of the North Atlantic charts drawn up in the Central Forecasting Office at Bracknell, without which this analysis would have been incomplete.

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Note. Mr R.M. Morris, Assistant Director (Central Forecasting Services), Met. Office, said:

'Readers may be interested to know how the Meteorological Office's operational 15-level numerical prediction model handled this particular explosive development in the lower troposphere. Figures 2 and 3 show the 72-hr and 36-hr forecasts respectively, of mean sea level pressure both

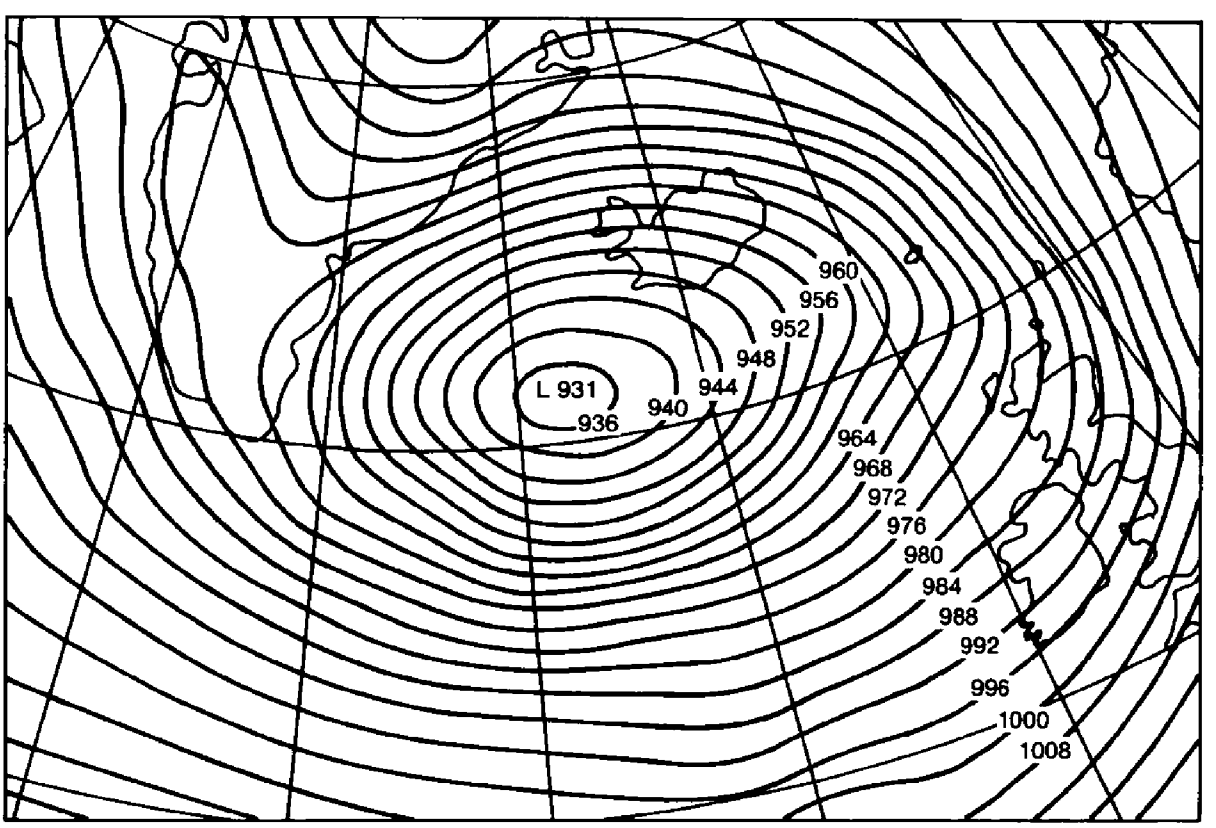

Figure 2. The 72-hr forecast.

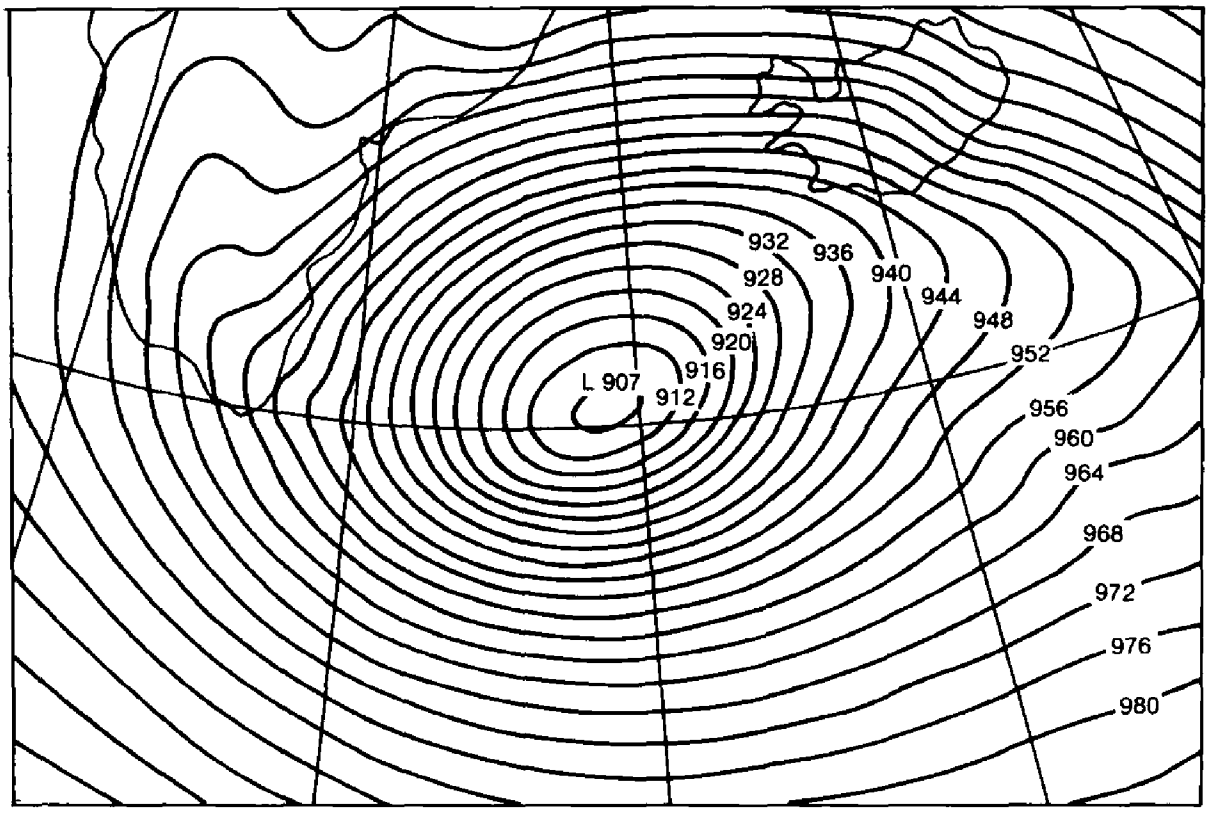

Figure 3. The 36-hr forecast.

verifying at 0001 GMT on 15 December 1986. Comparisons of these forecasts with the analyzed chart for the same time (Figure 1) indicate extremely good forecasts. The fine mesh model (T+36 hr forecast) had no difficulty in taking surface pressure down to uncharted territory (907 mb), and it should be noted that we cannot be certain that the analyzed central pressure of the depression was low enough.

'The text of the surface wind forecasts issued by the Central Forecast Office at Bracknell during the life of this depression must have frightened a good many listeners to radio broadcasts; rarely can "hurricane force 12" have been mentioned so many times in one forecast!'

Weather Influences on Battles and Invasions

By Lieutenant Commander S.J. Auty, R.N.
(Directorate of Naval Oceanography and Meteorology)

Introduction

As meteorologists within a fighting service, one of our prime tasks is the provision of weather forecasts in support of naval operations. The operations and hence the forecasts vary from day to day. Some are difficult and others are easy; some are very important and others less so. Probably the most important forecasts we make are the ones which influence the outcome of battles and invasions, so when I read that the Royal Meteorological Society's Specialist Group for the History of Meteorology and Physical Oceanography was holding a one-day discussion meeting on that very subject, I decided to go along to Birmingham to see what I could learn.

The programme included the following presentations:

The Battle of Salamis BC 480, by Mr I.J.W. Pothercary (Meteorological Office)
Caesar's Invasions BC 55, BC 54, by Dr G.T. Meaden (Tornado and Storm Research Organisation)
The Norman Invasion AD 1066 and the Arrival of William III AD 1688, by Professor J. Neumann (University of Helsinki)
The Spanish Armada AD 1588, by Professor H.H. Lamb (University of East Anglia)
The Battle of Trafalgar AD 1805, by Dr D. Wheeler (Sunderland Polytechnic)
The Crimean War AD 1854, by Professor J. Neumann (University of Helsinki)

Since the programme was fairly lengthy, I intend covering only those topics which I found most interesting. [Only the first presentation is described in this issue; others will succeed in two subsequent editions of *The Marine Observer* — Ed.]

The Battle of Salamis BC 480

This was not the first attempt by the Persians to invade Greece. In the fine, settled weather of September BC 492, they attempted to cross the Aegean but the force was lost in the Etesians off Athos. In BC 490 they were a little more successful and managed to make landfall only to be beaten at the battle of Marathon. In retreat they sailed south and attempted to establish a bridgehead at Falloran with the intention of attacking Athens. This proved to be impossible so they cut their losses and returned home. In BC 480 Xerxes cut a canal across the Athos peninsula, to avoid a repeat of BC 492, and attacked the Greeks at Thermopylae. Leonidas defended well and bought time for the Greeks to make a stand at Artemesium. Again the weather favoured the Greeks and part of the Persian fleet was wrecked by a storm at a peninsula north of Artemesium (Etesians again?). Undeterred, the Persians continued south but in the process they lost another 200

* Reproduced from *DNOM Newsletter*, Summer 1986, by kind permission of the Director of Naval Oceanography and Meteorology.

Photo. by K.C. Riddick

Sooty Tern found on board m.v. *Flinders Bay*. (*see* page 108.)

Photo. by Captain R.L. Westwater

Moth pictured on board m.v. *Irma M*. (*See* page 109.)

Opposite page 129

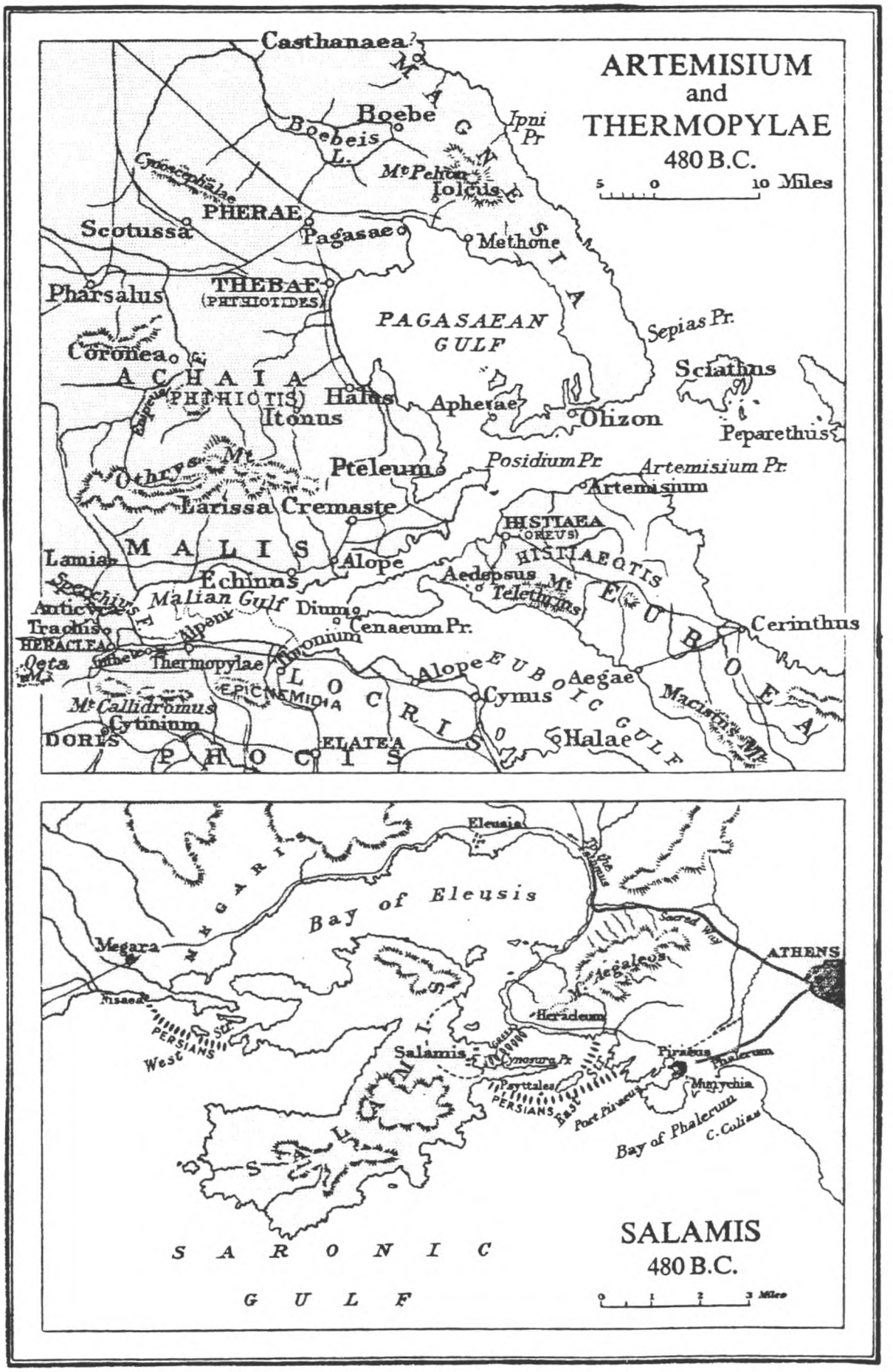

Figure 1. Positions of the Greek and Persian fleets at the Battle of Salamis

ships in the hollows off an un-named island and yet another 200 at Chalcis, but the remainder continued and headed into Falloran Bay. The allied Greek fleet waited in Salamis Bay. It speaks wonders for the original size of the Persian fleet to state that the Persians still had 600 ships with which to attack the 250 ships of the Greeks. Up to now it would appear that the effects of the weather had been following the rules of chance and it could be said that the Persians had been unfortunate. However, in the Battle of Salamis there seems to have been a positive attempt by the Greeks to use the weather to their advantage. Themistocles, the Commander of the Greeks, scattered the Persian fleet overnight by feeding them false information that the Greek fleet had left Salamis Bay. The effect of this was to delay the Persian attack and by the time it was launched, a sea breeze of 5 to 6 knots had sprung up from the SSE. The Persian ships being higher in the water than the Greek were affected to a greater degree and were blown towards the Greeks almost out of control (Figure 1). If the Persians were not in enough trouble already, the wind continued to back in the afternoon and made retreat very difficult. Suffice it to say that the Greeks won.

The story was well told and illustrated by Mr Pothecary and supported by firm meteorological knowledge of the area. However, there is no proof that Themistocles knew about the sea breeze, so that the story is an assumed one. Nor was there mention of currents or their likely effects. Nevertheless, the story is an interesting one and since most seamen tend to have a weather eye in their own area, I am inclined to believe that Themistocles did know about the sea breeze and by cunning was able to use it as a force multiplier.

AURORA NOTES JULY TO SEPTEMBER 1986

By R.J. Livesey

(Director of the Aurora Section, British Astronomical Association)

As usual, the observations received from mariners up to the time of writing are listed in Table 1. The general pattern of auroral activity observed by land and marine observers is reviewed in Table 2.

The big aurora of 11–13 September was of particular interest. First reports came in from U.K. observers as far south as the River Wear, on the evening of the 11th. Then, as the Earth rotated under the auroral oval, the American continent saw the full activity of the storm. Auroral light was reported by the NOAA Laboratory in Boulder, Colorado, to have been seen as far south as Albuquerque in New Mexico. Karl Lewis, an amateur magnetic observer in Saltash, Cornwall, recorded very high magnetic activity from 2100 UT on the 11th, with storm conditions throughout the 12th until about 0430 UT on the 13th, with further activity on the evening of the 13th. The American group of magnetic observatories reported a maximum peak storm condition between 0300 UT and 0600 UT on the 12th.

As the Earth's magnetic field recovered from the disturbance, and the Earth rotated further under the auroral oval, the aftermath took the form of auroral activity observed down to the latitude of Denmark. The aurora was well seen by a

Table 1 — Marine Aurora Observations July to September 1986

Date	Ship	Geographic Position	Time (GMT)	Forms in Sequence
26 Jul. ..	*Cumulus*	57° 00′N, 20° 00′W	0145	qN
28 ..	*Cumulus*	57° 00′N, 20° 00′W	0240	qN
1 Aug. ..	*Cumulus*	57° 00′N, 20° 00′W	0045–0130	qN
14 ..	*Tectus*	56° 30′N, 16° 06′W	0600	qN
31 ..	*Cumulus*	57° 00′N, 20° 00′W	2340–2358	qHB
5/6 Sept. ..	*Cumulus*	57° 00′N, 20° 00′W	2115–0250	qN, $p_3R_2R_3$, HA, qN
11/12 Sept. ..	*Cumulus*	57° 00′N, 20° 00′W	2204–0030	q(H+R_1)B, N
12 ..	*Cast Husky*	53° 25′N, 39° 45′W	0400–0442	pN, amHA, RA, p_2p_3RA, pHA, RB, RV, aurora over half sky
20 ..	*W.M. Neal*	47° 41′N, 59° 59′W	2305–2350	G, RA, HB, mR_1R
23 ..	*Farnes*	48° 05′N, 63° 30′W	0400	mP, RB, RA
24 ..	*Cumulus*	57° 00′N, 20° 00′W	2135	aR+B
25 ..	*Montarik*	70° 40′N, 09° 06′E	2230–2238	HB, RB, m_2RB
26 ..	*Cumulus*	57° 00′N, 20° 00′W	0130–0315	qN
29 ..	*ACT 7*	48° 26′S, 100° 07′E	1615–1640	HG, RR

KEY: a = active, m = multiple, p = pulsating, p_2 = flaming, p_3 = flickering, q = quiet, A = arc, B = band, G = glow, H = homogeneous, N = aurora of unspecified form, P = patch, R = rayed, R_1 = short rays, R_2 = long rays, RA = rayed arc, RB = rayed band, RR = rayed structure.

team of observers in Finland, who noted that the forms appeared to have expanded further south than usual, and that there were peculiarities in the appearance. This aftermath aurora on the night of 12/13 September was also seen in Scotland.

On 11/12 September, coronal ray structures appeared in south Norway, with rayed arcs and bands visible in Scotland. Active rays and bands covered half of the sky in the north of the U.S.A. On 12/13 September, all-sky aurorae with active bands were reported from central Canada and Finland, with homogeneous arcs in Denmark. On 13/14 September, coronal ray structures and bands were seen in Finland, while rayed bands were observed in northern Scotland.

Readers will recall in a recent report (*The Marine Observer*, July 1986, pp. 140–143) a discussion on the convergence of auroral rays, some of which are reported to come together above the horizon, as in a coronal structure, while other reports have suggested rays diverging from a point below the horizon. On 12 September, the *Cast Husky* at 53° 25′N, 39° 45′W reported the presence of a stationary pulsating arc at the zenith, brilliant along its south-facing edge, with rays flaming northwards down towards the horizon. The arc was white overhead, with flaming yellow, and green bands at both extremities. As the vessel was at magnetic latitude 63 degrees, Mr and Mrs Gribben, the reporting observers, were standing right under the auroral display, and the convergence would therefore be northwards from the arc to the magnetic zenith.

It might be of interest for observers to try to emulate the all-sky fisheye camera, and see what their drawings look like. With a pair of compasses, describe a circle on a piece of paper. Assume the paper to be held vertically above the observer, and sketch the auroral forms within the circle, the circumference of which represents the horizon. This method of drawing causes less distortion of the auroral forms, especially when overhead. One of our observers, Todd

Table 2 — Activity reported July to September 1986 (excluding doubtful, isolated or high latitude observations).

Date (Night)	Location and Number of Observers	Geomagnetic Latitude Lowest	Highest	at Storm Peak	Maximum Storm Activity code*	Time (GMT)
27 Jul.	Alberta (1)	64	—	—	5	0545–0715
2 Aug.	Alberta (1)	64	—	—	4	0618–0800
3	Alberta (1)	64	—	—	7	0600–0800
3/4	Orkney, Alberta (2)	61	64	61	6	2250–0145
11/12	Orkney (2)	61	61	61	5	2220–0200
20	Finland (1)	59	—	—	5	2040–2050
26	Alberta, Shetland (2)	62	64	62	6	0050–0130
29	Alberta (1)	59	—	—	5	0644–0729
30/31	Orkney, Nova Scotia (2)	56	61	56	4	2150–0330
5/6 Sept.	'Lima', Finland (2)	61	63	61	4	2215–0250
11/12	U.S.A., Canada, Atlantic, Scotland, Norway, Finland (14)	50	63	63	6	2100–0442
12/13	Canada, Scotland, Norway, Denmark Finland (11)	55	66	56	7	1900–0715
13/14	Canada, North Scotland, Norway, Finland (6)	60	66	66	6	1945–0800
14/15	North Scotland, Finland (4)	59	66	66	3	1940–0100
15/16	Finland (1)	66	—	—	6	1815–0015
17/18	Alberta, North Scotland, Finland (3)	61	64	62	6	2020–0430
22	Alberta (1)	64	—	—	5	0430
24	'Lima', Finland (2)	61	63	63	5	1840–2135
25/26	Alberta (4)	62	70	62	5	1930–0400
26	Atlantic, Finland (3)	62	70	70	3	2000–2100
27/28	'Lima' (2)	63	63	63	5	2100–0240
28	Finland (1)	62	—	—	6	1900–0000
29	Finland (2)	62	62	62	4	2300–2330

*Storm Activity Code: 1 = Glow or unspecified form, 2 = Homogeneous arc or band, 3 = Rayed arc or band, 4 = Ray bundles, 5 = Active storm, 6 = Coronal structures, 7 = All sky storm.

Lohvinenko in Winnipeg, uses this method on a regular basis for reporting overhead activity, and has found the process to be very effective. Results have been compared with all-sky fisheye camera photographs with satisfactory results. The observer, while drawing, can turn in azimuth while at the same time turning the paper to obtain the correct directions for each part of the drawing.

It is of interest to note that the September aurorae took place with virtually the same part of the solar disc facing the Earth as during the great aurora of 8/9 February 1986 and 6/7 March 1986, remembering that the sun appears from Earth to rotate once every 27 days. There was another repetitive series of disturbances traceable through 27 June, 24 July, 20 August, 17 September and 13 October, which were detected partly as magnetic and partly as auroral effects.

As we pass through sunspot minimum, apart from the odd major transient-type storm, most of the aurorae are quiet in form, and mostly confined to higher

latitudes. We have been very glad to receive the regular reports from professional meteorologists stationed at Wick, Kirkwall, Lerwick and on o.w.s. *Cumulus* at 'Lima'. Backed up by amateur astronomers in Orkney and Shetland, this group, nicknamed the 'Viking Line' has been keeping regular watch on the quiet aurorae between magnetic latitudes 61 and 63 degrees north. A provisional analysis of the reports so far received in 1986, from all observers in the Northern Hemisphere, suggests that the distribution of the lowest magnetic latitude at which auroral activity was seen each reporting night, is as given in Table 3. It should be noted that the figures are subjective as they are dependent upon the availability of observers and weather conditions.

Table 3 — Southernmost visibility of the aurora in the North Atlantic Region as a percentage of reporting nights in 1986 (provisional)

Magnetic latitude	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
Percentage of reporting nights	1	—	—	—	—	1	2	1	1	17	—	27	7	16	33

Note. The lower line does not add up to 100 per cent, several observations came in from higher latitudes, but did not give a true impression of the activity at these locations.

Bearing in mind that there is some relationship between the expansion of the aurora into mid-latitudes from the auroral oval, and the intensity and frequency of magnetic storms, it may be of interest to give some details of magnetic effects in the last few years. Let us total the days per annum on which the planetary magnetic index K_p reached a value of 5 or more, that is to say, storm conditions, in any three hours in the 24-hour day. This shows up the rising and falling of the effects of the sun on the magnetic field, as in Table 4.

Table 4 — Total number of days with storm conditions 1976–86

Year	76	77	78	79	80	81	82	83	84	85	86
Days with K_p 5 or more	46	51	81	74	44	67	123	100	97	62	46

Current statistical analyses suggest that sunspot minimum took place in August 1986, subject to observations in the early months of 1987. We may therefore look forward to a potential increase in auroral activity in mid-latitudes in the coming years, as the sun enters its new cycle. We look forward to your reports, for in spite of artificial earth satellites and other complicated technologies, there is never anything quite like having a look for yourself. Who was the sage who said that the Universe was not there unless there was an observer to see it? Best wishes for your further voyages.

From *The Marine Observer* 40 Years Ago

In his foreword to the first edition of *The Marine Observer* to be published on its reintroduction after the Second World War, in July 1947, Sir Nelson Johnson, the Director of the Meteorological Office wrote: "*The Marine Observer* had been in circulation 16 years when war caused its publication to cease in October, 1939. With the disappearance and the cessation of wireless weather reports from ships, we felt that an important link with the Merchant Navy had parted. We therefore welcome its reappearance as a symbol that the full co-operation of pre-war days has been resumed.

"Since 1939, however, much has changed...There have, of course, been many developments on the technical side in meteorology, largely to meet the demands of long distance flying which made such enormous strides in the war years. As a result there has arisen a need for more precise observations from merchant ships. The instruments and other means by which this object is to be achieved are being worked out, and will be communicated to you as soon as they are ready. In this *The Marine Observer* will play an important part.

"...In the past, *The Marine Observer* has served a number of useful purposes. In particular, the Meteorological Office has liked to regard *The Marine Observer* as a token of its appreciation of the invaluable service rendered by the Merchant Navy, and it is from this point of view that its reappearance after 7 years is most welcome to us. We hope that our friends afloat will be equally glad to see it again."

The foreword was followed by 'Marine Superintendent's Notes', in which Commander C.E.N. Frankcom introduced new readers to the journal by speaking a little of the past. "*The Marine Observer* was founded in 1924, at the suggestion of the late Marine Superintendent, Captain Brooke Smith, when Sir George Simpson was Director of the Meteorological Office. Its purpose was to provide an interesting, instructive, scientific journal as a tangible link between the Meteorological Office and the Corps of Voluntary Observers in British ships.

"...It was issued free to all ships whose Masters and Officers voluntarily made observations at sea, and to the Marine Superintendents of their shipping companies, and to certain scientific bodies; copies were also on sale to the general public, at home and abroad... It commenced as a monthly journal but in 1933 it became a quarterly publication. At the time of its first edition the number of Voluntary Observing Ships totalled 500 and by 1939 their number had grown to 360 Selected and 635 Supplementary Ships.

"...It is perhaps interesting to recall the great efforts which both sides made, throughout the war, to obtain their badly-needed meteorological information from the oceans, previously supplied by merchant ships. U-boats, warships of every type, aircraft and automatic buoys were all used in an endeavour to obtain information. Past records and climatological atlases assumed immense importance in an endeavour to increase our scientific meteorological knowledge and to probe the mysteries of the future weather — an all-important subject for all Naval, Military and Air Force operations.

"...Since November 1945, the Port Meteorological Officers and Merchant Navy Agents in British ports have been busily engaged in recruiting voluntary observing ships, supplying instruments and generally endeavouring to build up the Fleet. A target figure of 500 Selected and 500 Supplementary Ships has been envisaged as a desirable number of British ships to provide a reasonable network of observations from over the oceans."

In the accompanying tables the size of the Observing Fleet in February 1947 was shown to have grown to 422 Selected Ships, 197 Supplementary and 79 'Marid' Ships.

LETTERS TO THE EDITOR

From Dr Gerald T. Boalch, The Marine Biological Association.

'We are preparing a contribution to the *New Maritime History of Devon* and have been searching for sea surface temperatures to correlate with catches of pilchards and herrings for the south coast of Devon prior to 1900. There exist sea temperature records for Biscay as far back as 1864 but we have so far not found any consistent series for southwest England prior to the 1890s. Any records or suggestions as to where they might be found would be of interest to us. We would also be interested to know of any local records of fish landings prior to the start of Fishery Statistics in the 1880s. Any information please to Dr G.T. Boalch or Dr A.J. Southward at The Marine Biological Association of the United Kingdom, The Laboratory, Citadel Hill, Plymouth PL1 2PB.'

Dr Boalch provides expert analysis and comment concerning discoloured water samples collected by British observing ships.

Personalities

(Readers are invited to notify the Editor of observing officers retiring from the Navigating and Radio departments.)

RETIREMENT — CAPTAIN M.J. WINTER retired on 31 October 1986 after a varied and eventful sea life, but continues to put his experience to good use as a marine surveyor in the West Country.

Michael John Winter was born in November 1933 and educated at Bristol Grammar School. After pre-sea training at Bristol Tech., Department of Navigation, in 1949, he joined his first ship, *British Security* of the British Tanker Company, in January 1950. From early 1952 until January 1956 he served as an AB with various companies, including Elders and Fyffes, Donaldson and Esso, and went on to take his Second Mate's Certificate in May 1956. After short spells with Silver Line and Elder Dempsters he joined the Bristol City Line in August 1957.

Captain Winter gained his Master's Certificate in 1962 and 7 years later was promoted to command of s.s. *Bristol City*. After Bibby Line took over the Bristol City Line in 1972 he sailed in the former company's general cargo, container and LPG carriers until the end of 1977 when he moved to the Island Navigation Corporation of Hong Kong and commissioned the s.s. *Oriental Researcher* for her maiden voyage on the Far East container service. He later transferred to that company's London arm, returning to a previous command, *Dart America*, on the North Atlantic. Following the take-over of Furness Withy by the Tung Group in 1980 he continued to command *Dart* container ships up to the time of his early retirement for health reasons, his last five years being spent in *Dart Britain* during which period he managed to send the Met. Office 23 logbooks.

Captain Winter compiled the remarkable total of 80 meteorological logs in his time, and his persistence was rewarded in 1980 with the presentation of an inscribed barograph. During his 28 years of weather observing he submitted no less than 39 logs marked Excellent, commencing with his first, from *Gloucester City*, received in the Met. Office in April 1958. He also earned Excellent Awards in 1959, 1961, 1984 and 1985.

During his many years' service with Dart's North Atlantic ships, Captain Winter says he indulged his passion for ocean weather routeing, rendering much useful service to the Met. Office on the way. Since being forced to 'swallow the anchor' he has not been idle, and is presently engaged in marine surveying from his home near Buckfastleigh in Devon, and we wish him well in his occupation.

RETIREMENT — CAPTAIN J.W. HOOLEY has retired within a few days of the 40th anniversary of his becoming indentured to the Anglo-Saxon Petroleum Company in October 1946.

John William Hooley was born on 30 July 1930 and educated at Liverpool Collegiate School for Boys and the Outward Bound Sea School, between 1941 and 1946. His first ship was the *Nicania*, which he joined on 11 November 1946. Following a short period with Chapmans of Newcastle after sitting for Second Mate's examinations he joined Canadian Pacific Steamships in July 1951 and remained with that company until his retirement on 30 September 1986, apart from a year or so with Elder Dempsters between 1954 and 1955.

The first meteorological logbook in which Captain Hooley played a part came to the Met. Office from the *Beaverglen* in early 1953 and 39 more logs followed, of which 11 were assessed as Excellent.

Master's Certificate was gained in June 1957; Captain Hooley's first command was the *Beaverfir* to which ship he was appointed in February 1967.

Captain Hooley has memories of completing his first entry in a meteorological log in the first week of August 1951, although records do not exist of it, when he was a junior Officer in the *Empress of Scotland.* Princess Elizabeth and Prince Philip made the eastbound passage in the ship from Newfoundland to Liverpool in November of that year and a very bumpy passage it was, with no weather routeing available in those days. He spent a large slice of his career on the North Atlantic, thus depending on the gentlemen of Metroute, the ship routeing service at Bracknell, for assistance, which he states was first class even if the forecast weather was not, sometimes.

We wish Captain Hooley well in his retirement, and look forward to his planned visit to Bracknell to gain a first hand view of the weather action.

J.F.T.H.

Book Reviews

Flags at Sea by Timothy Wilson. 245 mm × 190 mm, 127 pp. plus end papers, *illus.*, hardback. HMSO, London. Price: £7.95.

This intriguing book fills a considerable gap in the literature on the subject, containing as it does much previously unpublished work on the history and evolution of maritime flags over the last five centuries. It presents some of the material in the incomparable collections of the National Maritime Museum,

where the author was engaged in research until 1979, when he moved to become Assistant Keeper in the Department of Medieval and Later Antiquities at the British Museum.

The book covers the subject of flags at sea most comprehensively in 7 chapters containing not only accounts about flags of Britain, Europe and the United States since the sixteenth century, but also sections on signalling, manufacture and the unrivalled collection at Greenwich. There are also 5 appendices containing individual papers of historic importance, a classified bibliography of 198 related books, notes about the text and an informative glosary of flag terminology. The latter tells us that the study of flags is called 'vexillology', a term coined in 1957 from the Latin *vexillum*, meaning a standard borne by troops, and having the same root as our modern word 'vehicle'.

The book is finely illustrated throughout, having a particularly interesting selection of colour plates showing such matters as the progress of the Royal Standard through the ages, flag charts and the changing patterns of British and foreign sea flags. All these greatly enhance the lively text which in one sense is a potted history of the struggles for superiority between monarch, navy and the merchant service.

The origins, reasons for use and general evolution of a variety of banners are mentioned; there are many black and white prints of historic drawings, although some of them are so unclear as to be of questionable worth, being reproduced to such a small scale that it is impossible to identify the captioned flags enumerated in the text. It might have been better to either enlarge the relevant sections of the drawings or have enlarged insets for the reader's benefit. However, this should not greatly detract from the large number of prints showing ships in famous battles, such as the Battle of the Glorious First of June in 1794 between the British and the French, and the Battle of Portsmouth, 1545.

The chapter on the history of the colours used by British merchant ships, which includes a section on house flags, may be of more concern to most readers, although this element is said to be less well recorded than the history of naval flags. Royal Mail flags also enter into this part of the book; pirate flags and the origins of the Jolly Roger are not forgotten. There is a brief section on flag signalling, augmented by a representation of the actual signal made by Admiral Nelson at the Battle of Trafalgar, in the numerical code devised by Captain Sir Home Popham in 1800. Nelson originally ordered for the signal made to be: 'England confides that every man will do his duty'; however, the signals officer of the *Victory*, Lieutenant John Pasco, replied [according to his own account, given many years later], 'if your Lordship will permit me to substitute the "expects" for "confides", the signal will soon be completed, because the word "expects" is in the vocabulary', (a numbered 'dictionary' of words and sentences) 'and the word "confides" must be spelt'.

The manufacture of flags is not forgotten, the chapter detailing sizes, proportions and fixing methods, and there are also notes about historic bills of account for flags supplied in April 1514 for the new pride of Henry VIII's fleet, *Henri Grace à Dieu*, for which the final sum, after haggling, came to £112.19s.8d.

Anyone with an interest in heraldry would probably wish to obtain a copy of this book, in addition to those at sea who have admired and handled flags of any kind; others who study history in the maritime context may also find this worthy book a useful addition to their shelves.

J.F.T.H.

Floodshock by Antony Milne. 255 mm × 175 mm, 176 pp., *illus.* Alan Sutton Publishing, Brunswick Road, Gloucester. Price: £12.95.

The history of the human race contains many unhappy events. Some are undoubtedly of our own making; others represent natural catastrophes in which the efforts of mankind are overwhelmed and belittled by the forces of nature. Perhaps the most potent threat is that posed by flooding, a view that is put forward in *Floodshock: the drowning of planet earth.* The author's aim of alerting the public to the immense destruction that can be accompanied by flooding, a fact that is not generally appreciated in this country, is only partially successful.

Descriptions of some of the world's most devastating water-related incidents commence with the most famous of all floods. The western civilizations are familiar with this through the account in Genesis, but other cultures (such as the Sumerians, Indians and Chinese) recount similar legends. Did it really occur or is it an abstruse piece of theology? Spurred on by the well publicized findings of an archaeological expedition half a century ago at Ur, in Iraq, the book proceeds as if it did and we are led into various theories, some more plausible than others, that might explain the Great Flood. The Biblical explanation of forty days and nights of rain is dismissed as being insufficient: it is also probable that it is an allegory. From the time of Plato to the present day, there seems to have been no shortage of alternative ideas, some of the more recent being the effect of a celestial object passing too close to the earth — the pole shift theory and the melting ice caps theory.

Our attention is then turned from a legendary flood to more recent and better-documented catastrophes involving the sea, storms and rivers, and in the next three chapters, various examples from around the world are highlighted. It would appear that Nature has extracted a high price for man's desire to create communities in close proximity to the sea, exposing them to hazards such as surges, tides and tsunami.

Humans are alone among the living creatures of this earth in that we have the power to alter and shape the environment in which we find ourselves. In *Floodshock*, the massive Soviet project whereby Siberian rivers will be diverted to irrigate the arid lands of central Asia is described. What are the consequences on global climate of such "earth-shaping" plans? Of more immediate interest are the climatic implications of deforestation, and Milne argues that this will lead to more floods.

Although aimed at the "popular" market, the scope of the book is quite large, and various aspects of meteorology, climatology, hydrology, history, geology and astronomy are mentioned. It is well endowed with black-and-white illustrations, and an up-to-date bibliography and comprehensive index complete the book. The diversity of topics has led to some serious errors, for example, a front is described as "a belt of air of a consistent temperature". Additionally, the author's tendency to hyperbolize has apparently gone unchecked and this further detracts from the book from a professional viewpoint. By its very nature, much of the content has appeared elsewhere; nevertheless, the publication of a book solely on the flood hazard is to be welcomed.

Dr M.S. Shawyer
Met. Office (Advisory Services,
extreme rainfall.)

Notices to Marine Observers

THE BRITAIN–AUSTRALIA BICENTENNIAL SCHOONER TRUST

In 1988 Australia will commemorate the founding of the first British Settlement in 1788. The Bicentennial gift from Great Britain to Australia is to be the 35-metre schooner *Young Endeavour*, designed by Colin Mudie and built by Brooke Yachts Limited of Lowestoft. The British Government have allocated £850 000 to the schooner and the Trust has been created to match that sum and produce the most remarkable gift possible; to achieve this, donations from British industry, commerce and individuals are being sought. As our contribution to the venture, the Met. Office is planning to loan meteorological instruments to the *Young Endeavour* to assist on the voyage from Britain to Australia and to provide the young volunteer crew with the opportunity to learn something of weather observing.

After sea trials the schooner will set sail from Portsmouth in August on a 16 000 mile voyage, following the path of the original ships. From Tenerife to Rio de Janeiro, across the South Atlantic and around the Cape to Mauritius, she will reach Australian shores after four month's sailing. She will celebrate her arrival in her new home by participating in the Tall Ships race from Hobart to Sydney in January 1988, arriving for the opening of the Bicentennial Celebrations. At the close of the celebrations, the schooner will be presented to the Royal Australian Navy for use as a sail training vessel available to all young Australians.

Commanded by Captain Christopher Blake, one of the few people to hold a Master's Certificate for Square Rigged Sailing Ships, acquired during periods on secondment from P. & O. Cruises Ltd., the *Young Endeavour* is crewed by 24 young people aged between 18 and 25, divided equally between men and women from both Britain and Australia. There will also be a nucleus of experienced sailing ship staff to assist Captain Blake on the voyage.

For further information, contact Mr Peter Sheldon, The Britain–Australia Bicentennial Schooner Trust, 99 Bishopsgate, London EC2M 3XD. Telephone 01 588 2439.

ROYAL INSTITUTE OF NAVIGATION'S 1987 INTERNATIONAL CONFERENCE

NAVIGATIONAL DATA DISSEMINATION AND DISPLAY

The future preparation, promulgation, storage, update and display of navigational information at sea, in the air and on land will be the topic for this year's D3—NAV 87 conference, to be held at the Heathrow Penta Hotel, adjacent to London Airport, from 29 September to 1 October 1987.

Speakers from the U.S.A., France, West Germany, Sweden, Spain, Canada, the Netherlands and the U.K., representing Meteorological Offices, Departments of Defence, Ordnance and Military Survey, Hydrography, R & D Establishments, Manufacturers, Motoring Organisations, ICAO, Eurocontrol, NOAA and the Law will examine the operational and institutional requirements and technical developments which are now the subject of international debate.

The Royal Institute of Navigation *Navigators Competition* also closes on 1 October; navigators, i.e. anyone who has been on a journey, under 23 years of age, are invited to write about a journey or invent a new navigational technique or write a history of some sort of navigation. Prizes in the past have included a sea voyage and a trip on *Concorde*.

Further details concerning both these items may be obtained from the Director, The Royal Institute of Navigation, 1 Kensington Gore, London SW7 2AT, telephone 01-589 5021.

Fleet Lists

GREAT BRITAIN (Information dated 23.3.87)

The following is a list of British ships which have been equipped with instruments and which voluntarily co-operate with the Marine Division of the Meteorological Office.

The names of the Masters, Observing Officers and Senior Radio Officers are given as ascertained from the last written returns received. The date of receipt of the last return is given in the second column. An asterisk indicates a new recruitment who has not yet sent in a logbook.

All returns received from observing ships will be acknowledged, direct to the ship, by the Marine Superintendent of the Meteorological Office.

The Port Meteorological Officers will make personal calls on the Masters and Observing Officers as opportunity offers, or on notification from the ship at any time when their services are desired.

Excellent Awards are made at the end of each calendar year. The names of the Masters, Principal Observing Officers and Radio Officers gaining these awards are published each July in *The Marine Observer*.

It is requested that prior notification of changes of service, probable periods of lay-up, transfer of Master or other circumstances which may prevent the continuance of voluntary meteorological service at sea, may be made to a Port Meteorological Officer or to the Marine Superintendent of the Meteorological Office at Bracknell.

Masters and Officers are invited to point out any errors or omissions which may occur in the list.

Selected and Supplementary Ships

Name of Vessel	Last Return Received	Master	Observing Officers	Senior Radio Officer	Owner/Manager
Abbey	13.1.87	R. Whistler	R. Gibbons, R. Berry, G. Webster	D. Hobson	Furness Withy (Shipping) Ltd
ACT 1	13.1.87	I.C. Macintosh	J. Spencer, H. Le Cornu, L.St.J. Campbell	D.A.C. Macrae	Blue Star Ship Management Ltd
ACT 2	21.10.86	D. Kissane	S.G. Millar, P.D.R. Bryan, I. Spikings	F.A. Dunn	Cunard Shipping Services Ltd
ACT 6	10.12.86	E.R. Jenkins	S.J. McNeill, D.F. John, M. Binnie	J. Cooney	Cunard Shipping Services Ltd
ACT 7	13.2.87	D. Newlin	M. Power, S.R. Pridmore, P.J. Neve	N.R. Smirk	Blue Star Ship Management Ltd
ACT 8	9.12.86	J.A. MacLeod	F.G.M. Whitaker, W.T. Duncan, G.M. Railson	C.S. Carver	Denholm (I.O.M.)Ltd
Adelaide Express	17.10.86	P.K. Sang	S. Mehta, S. Malhotra, R. Bhatia	S.T. Walanj	Silver Line Ltd
Al Shamiah	23.10.78	T. Williams	P. Walley		United Arab Shipping Co. (S.A.G.)
Aldrington	*	P.R. Thompson	L. Gibb, P. Robson	A. Facey	Stephenson Clarke Shipping Ltd
Albright Explorer	3.3.87	J.H. Kitching	S.J. Andaucci, T. Wright, W. Hutchings	R.J. McMurtry	James Fisher & Sons P.L.C.
Albright Pioneer	30.12.86	D.A. McLean	T.J. O'Connell, N.J.B. Fisher, J.V. Davies	G.R. Amick	James Fisher & Sons P.L.C.
Alert	3.1.85	A. Chalmers	P. Footman-Williams, C.J. Miners, D.M. Shepherd	J. Vaughan	British Telecom International
Andes	9.12.86	B. Walmsley	P. Marshall, I. Middleton, R.J. Owen	G. Graham	Furness Withy (Shipping) Ltd
Apapa Palm	20.1.87	H. McCole	J. Dickson, G.R. Mills, G.D. Dockerty	E.J. Emmett	Ocean Fleets Ltd
Appleby	30.9.86	T.F. Jones	R.J. Inge, A.S. Reed, R.W. Garner	S.H. Hollingworth	Ropner Management Ltd
Arapaho	22.1.87	J. Staines	K. Bland, R.A. Crook, D.D. Sargent	T. White	Silver Line Ltd
Arctic Corsair	8.4.86	B.C. Wharam		A. Spence	Boyd Line Ltd
Asifi	2.1.87	A.P. Maytham	K.E. Hammerman, R.P. Williams		Maersk (U.K.) Ltd
Astor	*	I.S. Currie	N.J. Palmour, J.D. Kingston, N.M. Robinson	J.T. Scott	Morgan Leisure Ltd
Atlantic Amity	10.7.86	J. Bruce	S.F. Hennessy, G. Garland, R. Kitchener	A. Brogan	Furness Withy (Shipping) Ltd
Atlantic Confidence	22.1.87	M.P. Jellicoe	J.C.P. Brown, R.G. Carnelley, P. Labistour	E.R. Fair	Furness Withy (Shipping) Ltd

Atlantic Conveyor	17.3.87	J.A. Oscroft	A.L. Le Goubin, J.K. Brocklehurst, M.G. Dexter	A.E. Burbidge	Cunard Shipping Services Ltd
Atlantic Fisher	21.9.82	H. Vane	I.F. Scarr, M.G. Wood, H. McWilliam	A.E.H. Jones	James Fisher & Sons P.L.C.
Atlantic Link	•	J. Lowe	R. Jackson, M. Pearce, A. Latta	R. Dolby	Ship-Link (U.K.) Ltd
Atlantic Star	13.2.87	C.S. Kingston	A.P. Macey, A.V. Robinson	T. Tims	Cunard Shipping Services Ltd
Atlantic Universal	22.9.86	T. Abbott	R.A. Thomson, D.P. Neaves	P. Canning	Gateway Shipping Ltd
Auckland Star	13.5.86	W.J.C. Jones	J.G. Ewart, N.J. Barr, A.H. Morbey	A.J. Pampling	Blue Star Ship Management Ltd
Author	26.11.86	D. Skillander	P. Walton, G. Laird, N. Humphreys	C. Brown	T. & J. Harrison Ltd
B.P. Harrier	5.6.85	D. Hamilton	P.M. Bowers, I.V. Hawkeswood		B.P. Oil Ltd
B.P. Humber	27.6.86	D.A. White	N.H. Moore, A.M. Lakey		B.P. Shipping Ltd
B.P. Vigour	23.3.87	J. Buchanan	H.J. Conlon, C.N. Curran	P.E. Davies	B.P. Shipping Ltd
B.P. Vision	26.11.86	P.A. Darlow	S.A. Chadwick, M.B. Deeming, C. Winterbottom	C.M. Taylor	B.P. Shipping Ltd
Baltic Eagle	5.6.86	J. Rose	D. Warmington, D. Sweet, S. Leake	O. Grimsdale	United Baltic Corp. Ltd
Baltic Progress	4.9.85	R. Kreamer	M. Kearney, B.L. Mullenger, R.H. Parker	D.A. Logan	United Baltic Corp. Ltd
Barbara E	23.2.87	G. Wostenholme	M. Beeley	M. Tyler	Maersk (U.K.) Ltd
Barber Hector	30.1.87	C.E. Woodward	H.M. Thompson, J.H. Warburton, P.M.N. Marsham	D. Miller	Ocean Fleets Ltd
Barrydale	25.2.87	R.L. Westwater	N.P. Colling, N. Sharma, F.R. D'Souza	D.F.M. Lobo	Fyffes Group Ltd
Bello Folawiyo	17.3.87	W.J. Byard	R. Holness, M.R. Davies, M.G. Brown	J.J. Crotty	Ocean Fleets Ltd
Ben Ocean Lancer	27.11.86	J.N. MacNish	D. Gilmour, S. Campbell	H.M.S. Cherry	Ben Line Steamers Ltd
Benalder	10.2.87	G. Reid	J.M. Groat, S. Polson, G.W. Blakey	R.J. MacDonald	Ben Line Steamers Ltd
Benavon	17.3.87	A.S. Hamilton	D.S. Hardie, A.R. Rendle, I.A. Marshall	H.E. Brookfield	Ben Line Containers Ltd
Benhope	19.9.86	R.E. Cowie	P.D Brooks, J.H. Clark, C. Tomlinson	R.J. MacDonald	Ben Line Steamers Ltd
Binsnes	9.1.87	C. Thomson	R.C. Avenin, C.V. Adams, C.W. Milne	D.E. Reilly	Jebsens Ship Management Ltd
Blue Excelsior	13.2.87	N. Hebden	C.J. Shill, I.J. Hockin, J.M. O'Ferrall	A.F. Critchley	Beta Maritime Services Ltd
Bluestream	28.1.87	P.G. Pinkerton	R.J. Clark, R. Mathur, A.J.P. Pinto	S.K. Poddar	Fyffes Group Ltd
Bolnes	21.11.86	A.M. Smart	W.D. Russell, S.H. Barnet, A.R. Farthing	P. Popple	Jebsens Ship Management Ltd
Bora Universal	28.11.86	F.H. Yeulett	R.E.O. Liley, A.J. McMaster, P.H. Evans	A. Crosland	Cayzer Irvine Shipping Ltd
Botany Bay	15.1.87	A.J. Leslie	T.G. Whittaker, A.M. Woods, N.E. Gardiner	C. Constantinou	P. & O. Containers Ltd
Bransfield	19.5.86	S.J. Lawrence	P.C. Serjeant, G. Hobbs	R. Wade	British Antarctic Survey
Bridgeman	6.1.87	F. Craske	M.J. McGhee, P.S. Wright, M.D. Kerr	R.I. Gow	Rowbotham Tankships Ltd
British Beech	17.10.86	M.C. Stephenson	J.P. Dunne, K. Patterson	J.H. Oliver	B.P. Shipping Ltd
British Esk	9.3.87	J.F. Thomson	J.C. Taylor, G.M. Hopkins, R.J. Atkins	K. Roberts	B.P. Shipping Ltd
British Forth	29.1.87	A.J. Lockwood	P. Armitage, R.M. Booth, A. Drew	M.C. Wakelin	B.P. Shipping Ltd
British Norness	30.12.86	P.N. Johnson	R.H. Stone, K.J. Fear, G. McGill	R.E.J. Wicks	B.P. Shipping Ltd
British Ranger	21.1.87	J.O. Bailey	R. Standing, J.N. Gregson, M.C. Lynch	M. Hewitt	B.P. Shipping Ltd
British Reliance	22.11.84	R.A.W. Jarrett	G.R. Snow, S.J. Viney	G.R. Wilson	B.P. Shipping Ltd
British Renown	23.1.86	G. Luff	J. Mellish, M.S. Vidgeon, I.L. Sutherland	C. Roberts	B.P. Shipping Ltd
British Resolution	12.2.87	K. Lawrence	S. Allibone, G. Proud, N. Hart	A. Steven	B.P. Shipping Ltd
British Resource	13.1.84	M. Stephenson	I. Hodge, R. Whatmore, K. Lynch	C. Davidson	B.P. Shipping Ltd
British Respect	2.3.87	R.S. Montague	D.S. Styles, N.G. Young, S. Duncan	K. Kielthy	B.P. Shipping Ltd
British Security	7.1.87	D. Coombes	W.S. Thom, S.J. Keitch, A. Parkinson	J. Yates	B.P. Shipping Ltd
British Skill	30.12.86	J.Y. MacAlpine	A. Brown, K. Kitchen, M.J. McGlone	C. Taylor	B.P. Shipping Ltd
British Spirit	24.11.86	L.V. McGeoch	D.R. Attrill, D.W. Tierney, C.R. Shoolbraid	J.W. Morphew	B.P. Shipping Ltd
British Steel	30.1.87	G. Spong	J. Taylor, A. Edwards, M. Richardson	J. Miller	Furness Withy (Shipping) Ltd
British Success	24.2.87	P.R. Waller	J.B. Dolan, M. Paradowski, C.D. Donoso	T. Browne	B.P. Shipping Ltd
British Tamar	28.1.87	R.A.W. Jarrett	S.H. McNiven, B.L. Gentry, T.M. Stone	P.F. Rogers	B.P. Shipping Ltd
British Tay	2.3.87	W. Young	A.J. Cable, G. Coull, N. Price	D.E. Dale	B.P. Shipping Ltd
British Tenacity	5.6.86	J.M. Ronald	W.J. Donald, R.J. Crawford, C.F. Robinson	M. Hewitt	B.P. Shipping Ltd
British Trent	8.1.87	P. Seaman	D.R. Robinson, J.C. Patterson, A. Crichton	M. McFaul	B.P. Shipping Ltd

Selected and Supplementary Ships *(contd)*

Name of Vessel	Last Return Received	Master	Observing Officers	Senior Radio Officer	Owner/ Manager
British Trident	*	H.E. Brown	A.M. Lakey, D. Jeffcock, -. Evans	B. Brycki	B.P. Shipping Ltd
British Wye	24.7.86	R. Friar	J.R. Gipson, N.R. Hart	R.O. Ball	B.P. Shipping Ltd
Broompark	27.11.86	M.J. Wray	W.A.C. Gill, B.P. Murphy, J.P. Martlew	A.L. Taylor	Denholm Ship Management Ltd
Buffalo	8.12.86	J.S. Biglands	M.E. Ingham, J.P. Murray, K.N. Metcalfe	S.P. Kavanagh	P. & O. Ferries Ltd
C.G.M. Provence	18.3.87	E.J. Maxwell	B.U. Jones, R.J. Dobson, W.W. Gibson	M.J. Sheldon	T. & J. Harrison Ltd
Cable Protector	*	E.E. Turner	P.S.D. Worrall, R. Malcolm		Cable & Wireless P.L.C.
Cable Venture	7.11.86	F.D.E. Kitt	J.A. Tollady, R.C. Phillips	M.E. Wilson	Cable & Wireless P.L.C.
Cableman	6.1..86	J.E. Bates	N.A. Lovesy, H.A. Williams	R.R. Hughes	Rowbotham Tankships Ltd
California Star	6.3.87	R. Brownbill	E.A. White, K. Lumby, A.H. Morby	A.J. Pampling	Blue Star Ship Management Ltd
Canada's Tomorrow	*				Canada's Tomorrow Discovery Corp.
Canadian Explorer	30.1.87	R. Llewellyn	C.M. Billington	I.M. Wetherill	Furness Withy (Shipping) Ltd
Canberra	9.1.87	I. Gibb	G. Waller. S. Love	F. Lloyd	P. & O. Lines Ltd
Canmar Ambassador	13.11.86	B.O.H. Brown	J.E. Whitley, A. Henderson, J.R. Shaw	I.S. Paterson	Canadian Pacific Steamships Ltd
Canmar Venture	19.9.86	H.A. Ross	B.G. Alexander, A.B.W. Rugg. M.E. Carter	D.J. Atkinson	Canadian Pacific Steamships Ltd
Canterbury Star	3.2.87	J.M.-Harneis	M.N. Mace, G. Warley, D.M. Thornton	S. Shayes	Blue Star Ship Management Ltd
Capricorn	20.6.86	Trachanas Dimitrios	Hatzipetros Nikolaos	Koytoyfaris Ioannis	Kappa (Maritime) Ltd
Cardigan Bay	12.2.87	R.J. Bland	G.M. Davis, L. Fletcher, K. Hardy	P.W. Furguson	P. & O. Containers Ltd
Carina	*				Kappa (Maritime) Ltd
Cast Husky	20.11.86	E. Williams	J.G. Wood, M.E. Winter, R.F. Gribben	M. Lobo	Denholm Ship Management Ltd
Cast Muskox	6.3.87	D.S. Ritchie	J.M. Rowe	F. Campbell	Denholm Ship Management Ltd
Cast Otter	11.2.87	R.W. Cotter	J.J. Millar, N. Whittaker, R.G. Valentine	N. Long	Denholm Ship Management Ltd
Catalan Bay	30.9.86	A.I. Juvale	M.M. Soni	N.P. Venugopalan, P. Karunakaran	Shipping Management S.A.M.
Celtic Ambassador	23.1.87	J. Twiselton	P.J. Dominey, E.J.R. Williams, R. Crook		C.M. Willie & Co. (Shipping) Ltd
Celtic Challenger	11.12.86	M.R. Gadd	J. Aynsley, M.R. Harris, J.M. Lethbridge	A.P. McLean	C.M. Willie & Co. (Shipping) Ltd
Celtic Link	18.2.82	H. Gray	H.W. Stewart, S. Duncan	D.N. Barlow	Ben Line Steamers Ltd
Celtic Mariner	17.3.87	J.K.H. Munday	P.A. Kelly, B.W. Bedworth, A Speed		C.M. Willie & Co. (Shipping) Ltd
Celtic Voyager	23.1.87	C.E.Thomas	A.W. Speed, C.J. Hook, C. Micmillan	N.R. Parker	C.M. Willie & Co. (Shipping) Ltd
Centaurus	*				Kappa (Maritime) Ltd
Challenger	*	M.A. Harding	D. McAlpine, J.W. Sellick		Natural Environment Research Council
Charles Darwin	6.3.87	K. Avery	D.G.J. Thompson, K. Avery, S. Sykes	J. Baker	Natural Environment Research Council
Chelsfield	10.3.87	J.M. Waller	K.A. Dean, A.D. Birtwistle, A.G. Liyanage	A. Gunasekera	Buries Markes (Ship Management) Ltd
Churchill	17.2.87	P. Mathews	G.S. Colenutt, M. Locke, D.P. Webb	P.A. Lindley-Curtis	Blue Star Line Ltd
Cirolana	5.8.86	M.J. Willcock	E.W. Pearson, R. Woodhouse, R. Hunt, W.J.F.M. May	R. Baty	Ministry of Agriculture, Fisheries & Food
City of Edinburgh	9.12.86	P.C. Thompson	T.A.H. MacDonald, R.S. Basford, A.R. Rendle	F.J. Curran	Ben Line Containers Ltd
City of Plymouth	25.11.86	K. Steven	B.R.G. Tasker, D. Bamford, J. Foley		Ellerman Lines Ltd
Clare	2.4.86	C. Schiller	M.S. MacColl, P.K. Paterson	D.W.B. Kellas	Furness Withy (Shipping) Ltd
Claymore	*	J. Campbell	D. Richmond, C. McUrdy, K. Cameron	J. Mathers	Caledonian MacBrayne Ltd
Clydebank	12.3.87	P.M. Anthony	S.T. Curtis, I.P. MacCormac, S.J. Attrill	N. Maclean	Bank Line Ltd

Coastal Pioneer	*	M.M. MacInnes	J. Young, D. Jennings		Fortoser Ltd
Cordoba	*	R.I. Crawford	J. Coleman, S. Ruiz, E. Walmsley	S. Pinch	Cardiff Ship Management Ltd
Dacebank	19.11.86	P. Simpson	W.W. Davies, P.B. Moulds, A.J. Dixon	D.F. MacGillivray	Bank Line Ltd
Dahlia	*				Beta Maritime Services Ltd
Dallington	22.4.86	R. Thompson	D.W. McAlpine	I. Blenkinsopp	Stephenson Clarke Shipping Ltd
Dart Americana	5.3.87	F.K. Gordon	R.S. Tremlett, G.R. Joshua, P.E. Jolley	M. Anderson	Canadian Pacific Steamships Ltd
Dart Atlantica	15.12.86	P. Denham	R.O. Jolliffe, R. Daya, C. Harding	M. Harvey	Canadian Pacific Steamships Ltd
Dart Britain	28.1.87	T.N. O'Driscoll	G.W.S. Darling, J.L. McCorquodale, A. Ashurst	N. French	Furness Withy (Shipping) Ltd
Dawpool	7.1.87	T.J. Proctor	R.F. Taylor, J. Sullivan, R.M. Thomas	J.D. Brown	Dawpool Shipping & Trading Ltd
Devonshire	3.10.84	R.A.F. Edwards	A. Pailing, R. Hodgson, R.B. Gillett	J.G. Palethorpe	Bibby Line Ltd
Discovery	30.1.87	M.A. Harding	S. Sykes, D.J.G. Thompson, A.K. Maltby	C. Page	Natural Environment Research Counci
Discovery Bay	1.12.86	A.J. Fee	P.M. Beggs, C.C. Young	W.B. Macintosh	P. & O. Containers Ltd
Donnington	15.8.86	M. Rushbrook	K. Whittaker, K. Monday, W.J. Headon	H. Gaskell	Stephenson Clarke Shipping Ltd
Drupa	12.2.87	M. Hardy	W. Parker, C. Blackmore, S.J. Potter	W.P. Westcott	Shell Tankers (U.K.) Ltd
Durrington	7.10.86	M. Rushbrook	D.N. Bridgens, M.B. Wdowikowski	I.C. Petrie	Stephenson Clarke Shipping Ltd
E.W. Beatty	25.2.87	W.A. McCall	B. Pocklington, S. Currie, R. Tremlett	S.V. Ranadive	Canadian Pacific Steamships Ltd
Earl Granville	30.10.84	M.G. Mills	B. Hayball, P. Goode, P. Harris	P. Jordan	Sealink (U.K.) Ltd
Ebalina	16.2.87	R. Firth	J.G. Tarling, F.D. Goodwin, C. Johns	A. Fielding	Shell Tankers (U.K.) Ltd
Eburna	11.2.87	H.L. Graham	J.A. Forsyth, N.A. Barningham, J.A. Fortnum	J. Fitzgerald	Shell Tankers (U.K.) Ltd
Echoman	20.11.86	D.R. Cummins	D.A. Hore, J. Wilson	P. McVeigh	Rowbotham Tankships Ltd
Elgurdabia	6.8.86	J.W. Niblock	R.J. Bridge, M.E. Lacey, S. Westrip	A.G. Thomson	Ocean Fleets Ltd
Elk	28.11.86	M.R. Godfrey	R.W. Madden, S.M. Scott, J.M. Latus	C. Keeble	P. & O. Lines Ltd
Encounter Bay	20.11.86	T.L. Watson	G.D. Mead, M. Watts, C.K. Unwin	P. M. Dolphin	P. & O. Containers Ltd
Endeavour	12.11.86	D. Rouse	W. Lunn, P. Thompson, R.M. Pitts	P. Rowe	Souter Shipping Ltd
English Star	4.3.87	E.C. Smith	P.S. Sinclair, C. Munday, N.A. Wright	J.M. Shand	Blue Star Ship Management Ltd
Entalina	15.10.86	A.R. Reynolds	J. Cornwall, A.D. Guillaume, A.J.M. Leach	C. Evans	Shell Tankers (U.K.) Ltd
Enterprise	16.2.87	T. Robinson	C.M. Ashton, P.F. Curry, G. Code	P. White	Souter Shipping Ltd
Equinox	2.3.87	K. Greest	K. Henderson, N. Riley, K. Webb	A.R. McCormick	Souter Shipping Ltd
Erinna	9.1.87	M. Geddes	R. Linley-Munro, R. Robertson, I. Creed	T.W. Slater	Shell Tankers (U.K.) Ltd
Ervilia	26.11.86	N. Bradbrook	S. Gallaway, P.V. Martin, F. Hugo	A. Stewart	Shell Tankers (U.K.) Ltd
Esplanade	11.2.87	B.G. Longley	C.D.R. Bain, R.W. Purser, P.A. Lanaghan	C.A. Dillon	Souter Shipping Ltd
Esso Aberdeen	17.10.86	W. McMaster	K. Hudson, A.D. Stuart, G.R. Dunkley	J. Rennie	Esso Petroleum Co. Ltd
Esso Demetia	11.11.86	A.J. Washbourne	K.H. Milne, A. Lowe	R. Duff	Esso Petroleum Co. Ltd
Esso Tees	26.11.85	J.W. Aalen	P. Grounds, K. Lightbody, M. Walsh	C. McNeilly	Esso Petroleum Co. Ltd
Esso Warwickshire	23.2.87	R.G. Whitford	W.B. Wilson, M. Hustwith, K.H. Milne	R.A. Smith	Esso Petroleum Co. Ltd
Etrema	8.10.85	M. Lewis	G.C. Squirrell, I. Rees, G. Nicholls	G.G. Graham	Shell Tankers (U.K.) Ltd
Eulima	28.5.86	G.J.T. Drummond	T.H. Scott, R.G. Robertson, B. Morley	K. Scargill	Shell Tankers (U.K.) Ltd
Eulota	30.9.86	P.N. Bowden	G.D. Nicholls, N.A. Barningham, R.W. MacLeod	T. Summers	Shell Tankers (U.K.) Ltd
Euplecta	26.11.86	J. Grisdale	D.S. Warren, S. Mathews, J. Ruffell	J. Murgatroyd	Shell Tankers (U.K.) Ltd
Europa Point	10.9.86	I.C. Dorse	Javed Akhtar, D. Qaiser Nasir, A. Anwar Jaffri	A.S. Siddiqui	Acomarit (U.K.) Ltd
Eye of the Wind	12.1.83	R.S. Grono			Adventure under Sail
Falcon Arrow	*	S. Brown	S. Kelsall, J.W. Parkinson, S.M. Brambles	M.G. Rodger	Jardine Ship Management Ltd
Falklands Desire	17.3.87	D. Noble	O.M. Lynch, S. Rogers, J.A. Clark	R. Hunter	J. Marr & Son Ltd
Falklands Right	*	T. Barkworth	B. Wilson	R- Wilkinson	J. Marr & Son Ltd
Farland	17.3.87	R. Copeland	P.J. Lightfoot, D. Wallis, P.R. Hamlin	G.S. Thomson	Ropner Management Ltd
Farnella	10.12.86	M.A. Paterson	A. Fuller, R. Cunningham	P. Appleyard	J. Marr & Sons Ltd
Farnes	28.1.87	A. Gatt	J. Wilson, I. Grainger, S. Comfort	A. De La Grense	Jebsens Ship Management Ltd
Festival	16.1.87	V.M. Khan	T.B.N. Shah, M. Mohiuddin, A.N. Khan	Z. Ali	Gulf (Shipowners) Ltd

Selected and Supplementary Ships *(contd)*

Name of Vessel	Last Return Received	Master	Observing Officers	Senior Radio Officer	Owner/Manager
Firmnes	18.11.86	M.J. Meyer	R. Claridge, J.S. Jaanus, S.J. Heggie	D.R. Allen	Jebsens Ship Management Ltd
Fleet Wave	11.3.87	J.E. Sturgess	E.R. Bruce, C.S. Balakhrishna, R.R. Kamat	K.K. Pandit	Fyffes Group Ltd
Flinders Bay	19.2.87	D.A. Dornom	W.J. Stoker, C.C. Woodward, K.C. Riddick	J.A. McKay	P. & O. Containers Ltd
Fort Assiniboine	10.3.87	D.A. Tipping	C. Ireland, C. Rossell, C.B. Mawer	P. Hemmerman	Canadian Pacific Steamships Ltd
Fort Dufferin	18.8.86	G.B. Ivens	N.J. Coghlan, A.V. Gale, G.B. Clement	N. Kell	Canadian Pacific Steamships Ltd
Fort Frontenac	29.1.87	J. Currie	S.J. Hutty, T. Fisher, J.G. Grannon	D.J. Minihane	Canadian Pacific Steamships Ltd
Fort Garry	3.2.87	M. Allen	R.C. Veale, R.E. Musgrove, D.F. Shepherd	B. Buckenham	Canadian Pacific Steamships Ltd
Fort MacLeod	7.7.86	G.S. Oakley	S.J. Hutty, S.M. Collins, H.R. Niblock	R. Brien	Canadian Pacific Steamships Ltd
Fort Providence	28.1.87	P. Moore	M.J. Stopford, A. Graveson, A.T. Clarke	J. Blaylock	Canadian Pacific Steamships Ltd
Fort Resolution	28.1.87	A.G. Moat	C. Riches, P. Bland, P.J. Brewer	P.M. Sharp	Canadian Pacific Steamships Ltd
Fort Rouge	17.11.86	P.H. Hill	P.N. Brant, A.C. Day, J.P.H. Simcox	M.J. Corry	Canadian Pacific Steamships Ltd
Fort St John	11.3.87	A. Stobbs	G.D. Weaver, J. Dalisay, M. De Filipe	A. Lagrido	Wallem S.M.S. (I.O.M.) Ltd
Fort Steele	19.2.87	J.S. Rind	R.C.B. Booth, K.P. Doyle, W.G. Dickinson	P.R. Howard	Canadian Pacific Steamships Ltd
Fort Toronto	18.6.86	D.A. Tipping	P.A. Chalmers, A.J. Bentley, W.G. Dickinson	D.W. Lever	Canadian Pacific Steamships Ltd
Forthbank	30.12.86	D. MacPhail	E.P. Mullan, M. Armstrong, R. Hanraads	J. Allen	Bank Line Ltd
Frederick Russell	11.10.83	P.H. Warne	M.S. Pitman, R.J. Chamberlain		Natural Environment Research Council
Fremantle Express	23.2.87	H.K. Chopra	I.P.S. Malhotra, P. Priya, K.K. Basu	K. Vinchhi	Silver Line Ltd
G.A. Walker	9.3.87	G.S. Oakley	J.H. Arton, B. Scott, S.H. Andrews	R.P. Philpott	Canadian Pacific Steamships Ltd
Ga Chau	2.4.86	H. Connell	A.E. Regan, J.P. Martlew, D. Paul	S.A. Lamb	Denholm Ship Management Ltd
Gardline Locator	7.10.86	L.M. Wigmore	I.W. Crane		Gardline Shipping Ltd
Gas Enterprise	4.2.87	I. Alexander	D. Stitson, D. Lewis, B. Cook	P. Trant	B.P. Shipping Ltd
Geestbay	2.2.87	D.N. Boon	J. Hickey, C.M. Davies, J. Worwood	M. Morgan	Geest Line Ltd
Geestcape	14.1.87	K.M.R. Skinner	M.F. Tomlinson, E. Gander, S. Allen	A. Steel	Geest Line Ltd
Geesthaven	*	G. McDonald	J. Williams, R. Breedon, M. Tomlinson	M. McGregor	Geest Line Ltd
Geestport	30.12.86	M. Davis	J.H. Worwood, N.P. Lewis, D. Roberts	K. Brown	Gest Line Ltd
Glenavon	*	A. Phillips	B. Padfield, P. Hackwell, M. Windows		Wessex Water
Gold Varda	30.10.85	R.M. Mitchell	R. Borkowski, S.J. Windle, R. Ross	D.H. Logie	Haverton Shipping Ltd
Graiglas	19.2.87	R. Wade	P.V. Brown, E.M. Holmyard, F.J. Nichol	A. Cheshire	Garth Shipping Co. Ltd
Hampshire	4.3.87	P.S. Bytheway	D.C. Gilbert, R. Hodgson, N. Michael	J. Palethorpe	Bibby Line Ltd
Harefield	21.1.87	K. Moger	G.C. Durward-Akhurst, K.R. Denney, T. Gunanayagam	M.H. Waples	Buries Markes (Ship Management) Ltd
Harlech	*	N. Passey	Uday Bhandarkar, C.Y.S. Nath, G. Vurgese	N. Tripathy	Blue Star Ship Management Ltd
Harold La Borde	16.1.87	J.R. Hughes	D. Browne, A.M. Clifton, P. Ashurst	T. Elliott	Bibby Line Ltd
Havdrott	21.10.86	R.W. Knight	M.A. Youel, T. Goldsmith, D.T. Simpson	A.G. Thompson	P. & O. Lines Ltd
Havjarl	10.12.86	M.A. Hill	P. Braid, J.H. Lyall, C.S. Card	M. McKenny	P. & O. Lines Ltd
Havkong	9.3.87	M.A. Hill	I.T. Blackley, J.C. Holmes, R. Tanguy	A. MacKinnon	P. & O. Lines Ltd
Hebridean Isles	25.11.86	C.W. Billimore	D. Malcolm, R. Morrison, M. Buchanan	I.M. Charlton	Caledonian MacBrayne Ltd
Hekabe	4.11.86	D. Heaselden	J. Moulds, R.P. Willis, K.M. Haley, N. Vause	M.B. Smith	P. & O. Lines Ltd
Helikon	20.8.86	A.D.G. Bell	N.L. Davis, A.L. Selmer, B.C. Pritchard	W.A. Boyle	P. & O. Lines Ltd
Hermina	5.2.87	D. Heaselden	K.I. Mockett, G.R. Phillips, S.G. Armstrong	A. MacGillivray	P. & O. Lines Ltd

Hermod	23.3.87	J.O. Spence	H.G. Pollard		P. & O. Lines Ltd
Hesiod	20.11.86	M.J. Carter	A.J. Whitcher, W.D. Phimister, S. White	R.J. Leeds	P. & O. Lines Ltd
Highland Reel	23.6.86	C. Green	D.J. Cowie, R.G. Lines, G. Collier	P.R. Lacock	Ugland Marine Ltd
Hoegh Duke	21.10.86	A.J. Cheshire	M. Ellis, W.R. Houghton-Boreham, R.A.A. Morrison	H.G. Moran	Blue Star Ship Management Ltd
Humanist	6.3.87	J.G. Small	J.B. Anton, Ho King Pui, Quazi Hafizalalam	T.Y. Rangaparajan	Ocean Tramping Ltd
Hupeh	7.1.87	B.G. Dixon Ward	J. Bird, C.J. Ryden, A.V. Hart	H.H. Luk	China Nav. Co. Ltd
I.T.M. Installer	5.2.87	C.D. Brown	G.R. Ticehurst, N.E. Haslam		I.T.M. (Offshore) Ltd
Iberita	*	J.A. Attwater	S. Deshpande, D.K. Malhotra, E.C. Reuben	S. Deshpande	Ugland (U.K.) Ltd
Ibn Abdoun	9.12.86	M. Singh	Y.M. Ibrahem, A. Singh, M.V. Kumar	L.J. Ferrao	United Arab Shipping Co. (S.A.G.)
Ibn Rushd	22.10.86	P.O. Kean	Ahmed A.N. Kulkhan, Rafik K.M. Cadalla, Munhwar Hussain	C.A. Kemp	United Arab Shipping Co. (S.A.G.)
Iolair	16.12.86	I.W. Ferguson	A. Lockie, N. Rothney	J.R. Bruce	B.P. Shipping Ltd
Ionic Ferry	2.12.85	M. Edward	H. Corkhill	D. Thomas	Townsend Car Ferries Ltd
Irma M	9.1.87	N.W. Thomas	N.P. Colling, J.S. Dennis, H. Sanjay	G.M. Karkhamis	Fyffes Group Ltd
Isle of Arran	2.3.87	A. Ferrier	D.G. Carchrie, D.A. Armstrong, N. Jones		Caledonian MacBrayne Ltd
Isocardia	15.10.86	M.M. Wilkie	S.K.M. Turnbull, J.W. Arnott, D.E. Picking	M.B. Ryan	Shell Tankers (U.K.) Ltd
Isomeria	2.12.86	C.G. Scarf	G.C. Squirrell, J. Sharp, J.W.N. Holmes	J. O'Toole	Shell Tankers (U.K.) Ltd
Iver Champion	17.4.85	G. Milburn	F.H. Heath, A.M. Stobbs	R.P. Billett	Wallem S.M.S. (I.O.M.) Ltd
Ivybank	19.12.86	A.T. McGregor	I.D. Cumming, A.L. Jeffrey, R.G. Penhaligon	F. Wilson	Bank Line Ltd
Jasmin B	*	R.B. Stephens	S.P. White, P. Shute, C.H. Shill	W. Sterling	Beta Maritime Services Ltd
John Biscoe	15.4.86	E.M.S. Phelps	J.R. Harper, M.J.S. Burgan, P. Kerry	S.D. Buxton	British Antarctic Survey
Jostelle	28.11.86	A. Clish	N.E. Blythe, W. Brothers, J. Towler	A. Knight	Souter Shipping Ltd
Jura	15.12.86	S.S. Lockhart	B.A. Hall, J. Barkess, M.L.J. Jewell		Department of Agricultural & Fisheries for Scotland
Keta Lagoon	12.3.87	Prince K. Fosu	G. Attah, C.S. Johnson. Tutu-Saki	W. Archampong	Black Star Line Ltd
Kildare	29.10.86	M.H. Wilson	D.P. Symons, C. Campbell	P. Enrico	P. & O. Lines Ltd
Kingsnorth Fisher	19.11.86	T. Wright	A. Tattersall, K. Lockhart, A. Hood	D.R. Woods	James Fisher & Sons Ltd
Kona	23.5.86	T. Isbister	A.J. Gillies, B.H.E. Course, G. Pearce	P. Stanway	Denholm Ship Management Ltd
Kowloon Bay	27.1.87	C.R. Short	C.J. Petty, C.J. Hughes, B.J. Coupland	D.K. Alcock	P. & O. Containers Ltd
La Chacra	16.3.87	J.W. Gurton	R.H. Evans, D.A. Lemon, I.C. Newsome		Buries Markes (Ship Management) Ltd
La Pampa	11.2.87	C. Crofton	N. Beal, P. Heath, C.A. Bates	W. Guinan	Buries Markes (Ship Management) Ltd
Lackenby	2.2.87	I. Wemyss	P. Molloy, I.C. Gravatt, A. Storrie	T.F. Croft	Ropner Management Ltd
Lairg	6.8.86	H. Windle	C. McCulloch, J. Owens, P. Dixon	R.J. Evans	Blue Star Ship Management Ltd
Lakenes	22.10.86	P. Davies	J.W. Southgate, C. Brown, R. Baker	B. Hansen	Jebsens Ship Management Ltd
Lanark	5.3.87	I.C. Mackintosh	J.C. McCabe, P.A. Owen, D.J. Horsfield	R.A. Graham	Blue Star Ship Management Ltd
Lancasterbrook	17.2.87	I. Anderson	S.D. Clarke, D.A. Hughes		F.T. Everard & Sons Ltd
Lantau Trader	3.9.86	C.D. Riley	Wong Chi On, P. Holloway, A.K. Minocha	M. Moynihan	Denholm Ship Management (Overseas) Ltd
Lavender	*	M. Walker	J. Goddard, I. Robinson, B. Fleming	A. Knight	Beta Maritime Services Ltd
Leicesterbrook	11.8.86	J.J. Myles	W.G.S. Williams, C.G. Buckley		F.T. Everard & Sons Ltd
Leonia	24.2.87	R. Firth	R. Porteous, G.W. Varney, A.D. Broad	M. Collins	Shell Tankers (U.K.) Ltd
Leslie Gault	25.4.86	R. Phillips	D.A. Wilkinson, I. Spence	D.M. Healey	Denholm (I.O.M.) Ltd
Lima	29.10.86	G. Wilson	C.R. Love, R.N. Richards, T. Southwood, W.J. Marshall	K. Roberts	Shell Tankers (U.K.) Ltd
Limari	15.1.87	P.H. Datham	D. Valentine	M. D'Silva	Wallem S.M.S. (I.O.M.) Ltd
Lincolnshire	16.12.86	J.A. Corcoran	G.M. MacLeod, R. Oliver, J. Docker	W. Ormrod	Bibby Line Ltd
Liverpool Bay	23.3.87	R. Dinnie	R.J. Curry, D.L. Batchelor. M. Leech	B.A. Mullan	P. & O. Containers Ltd
London Spirit	21.1.87	A.D. Gillie	D. Wyllie, R. Fullagar, W. Howarth	I.F. Alexander	London & Overseas Freighters P.L.C.
London Victory	21.10.86	A.C. McNab	C.A. Cornish, T.C. Swatton, J.W.W. Peters	C. Stuart	London & Overseas Freighters P.L.C.
Lord Kelvin	23.1.87	J.O. Jubb	S. Shaw, J. Spurgeon, R.D. Buckham	J. Goldsmith	Furness Withy (Shipping) Ltd

Selected and Supplementary Ships *(contd)*

Name of Vessel	Last Return Received	Master	Observing Officers	Senior Radio Officer	Owner/Manager
Lucerna	22.1.87	J. Hart	R.O. Garner, S.J. Daniel, R.M. Hopper	C.A. Hall	Cunard Shipping Services Ltd
Lumiere	*	B. Nuttell	M. Green, R. Dit-Leschery, P. Kaye	N. Mathews	Cunard Shipping Services Ltd
Luminence	18.10.85	B. Fern	C. Kitchen		Crescent Shipping Co. Ltd
Luminetta	9.3.87	D.M. Woolfenden	D.S. Hughan, P. Phibbs, S.G. Dougal	S. Myland	Cunard Shipping Services Ltd
Maersk Harrier	24.2.87	D. Worrin	P.J. Ward, T. Lawrence, M.J. Catt	G. Smith	Maersk (U.K.) Ltd
Mairangi Bay	3.3.87	C.B. Walgate	I.S. Norris, D. Tracey, L. Nelson	G. Scullion	P. & O. Containers Ltd
Mairi Everard	16.1.85	J. Twiselton	T. Harrison, P. Bayliss, D. Gilbert, F. McCorlick		F.T. Everard & Sons Ltd
Manchester Challenge	20.1.87	W.R. Strevens	S.W. Douglas, G.R. Green, N.P. Sherry	K.H. Garlinge	Furness Withy (Shipping) Ltd
Mark - C	12.3.87	S. Smith	D. Martin, M. Hawkes, M. Rickaby		Carisbrooke Shipping Ltd
Marsman	25.2.87	A.G. Mount	M.D. Kerr, N. Gralka, G.P. Holmes	T.A. Smith	Rowbotham Tankships Ltd
Matco Avon	23.6.86	M.E. Newall	K.H. Calladine, A.J. Robinson, D. Marshall	M. Lambert	Mobil Shipping & Transportation Co.
Matco Clyde	2.9.86	P.A. Crabtree	A.D. Hill, M. Davies, N.J. Cooke	R.B. Hardy	Mobil Shipping & Transportation Co.
Matco Thames	22.1.87	K. Curry	C. Graham, H. Jones, N. Proctor	M. Bowler	Mobil Shipping & Transportation Co.
Mediterranean Shearwater	26.8.86	J.Y. Cairns	G. Proud, M.L. Miller	A.P. Austen	James Fisher & Sons P.L.C.
Melampus	9.12.86	M.J. Knight	G.J. Andrews, A. Warren, P.I. Anderson	R. Stevens	Ocean Fleets Ltd
Melton Challenger	25.7.86	T. Hunter	S. Milner, J. Beck, J.D. McFaul		Melton Shipping Co. Ltd
Memnon	26.11.86	J. McGechen	I. Thomas, R.C.J. Wiltshire, M. Garside	D. Gunning	Ocean Fleets Ltd
Menelaus	7.1.87	H.R. Lawton	W.E.L. Godesll, S.C. Westrip, K.S. Markwell	M.R. Palmer	Ocean Fleets Ltd
Merchant Patriot	21.10.86	C.R. Thomas	A.D. MacPherson, D. Johnstone, D. Wood	D.M. Williams	Denholm Ship Management Ltd
Merchant Pioneer	28.8.86	E. Betts	M.E.J. Dunbar, D. Jenkinson. B. Waddell	B. Main	Denholm Ship Management Ltd
Merchant Prelude	*	E. Arciszewski	E. Trebicki, K. Mawnowski	S. Daszuta	Denholm Ship Management Ltd
Merchant Principal	12.2.87	E. Betts	A.J..C. Braganza, A.S. Phatak, Brijesh Midha	S.D. Wangdi	Denholm Ship Management Ltd
Monarch	*	A.J. Chalmers	G. Digby, P. O'Sullivan, M. Phillips, G. Chant, G. Broadbridge	D. Vowles	British Telecom International
Montarik	2.3.87	W.F. Jeffrey	T. Karamat, G. Rasul, K.R. Khan	M.M. Zaidi	Acomarit (U.K.) Ltd
Moraybank	17.2.87	C.B. Davies	P.S. Chase, P.M. Frost	P. Haslam	Bank Line Ltd
Moreton Bay	15.1.87	D.C. Blackman	P.A. Furneaux, N.M.V. Salmon, C.R. Merry	R.B. Redhead	P. & O. Containers Ltd
Nassau Pride	19.2.87	G. Watson-Wood	W.O. Garner, G. Dyson, R.M. McDonald	B. Davies	Garth Shipping Co. Ltd
Naticina	28.10.86	J.A. Stuart	P.A.J. Tickell, R. Mills, C. Lovett	T.E. Bint	Shell Tankers (U.K.) Ltd
Neptune Jasper	2.9.86	J.B. Hughes	Vinod Raj Bali, T. Thirvchelvam, Maung Maung Aye	Myo Win	Neptune Orient Lines Ltd
Nickerie	9.1.87	J.J. Robinson	E.M. Meare, M.A. Rahiman, V.K. Vijayan	P. Chattopadhyay	Fyffes Group Ltd
Northern Explorer	28.1.87	M. Thomson	F.W. Brown, D. Farrington, I.A. Patterson	R. Boatman	Denholm Ship Management Ltd
Northia	30.7.86	B.B. Pearson	P.V. Martin, J. Cranston, N.D. Roberts	P.M. Croft	Shell Tankers (U.K.) Ltd
Nosira Lin	10.12.85	I. Woodier	S.J. Kembery, J.C. Theaker, N. Howarth	N. McCreary	Bolton Maritime Management Ltd
Nosira Madeleine	6.8.86	M.A. Gater	K.E. Powell, P.M. Bailey, D.J. Williamson	A.E.H. Jones	Bolton Maritime Management Ltd
Nosira Sharon	11.9.86	J. Milner	P.F. Goodchild, J.C. Theaker, C. Cooke	A.J. Bassett	Bolton Maritime Management Ltd
Oil Hustler	*	N. Brown	L. Elms		Ocean Inchcape Ltd
Ormond	5.3.87	H.C. Hynard	S.G. Leitch, B.J. Kirtley, J.A. McCullough	R.C. Boyle	P. & O. Lines Ltd
Osaka Bay	2.1.86	J.K. Blackburn	M. Barraclough, D.J. Bailey, L.H.M. Johnson	M.R.T. Hannan	P. & O. Containers Ltd
Pacific Crane	17.3.87	D. Marr	N. Dilkes, G.J. Himsworth, M.J. Stares	T. McMahon	James Fisher & Sons P.L.C.

Pacific Guardian	31.7.85	P.R. Shaw	J.A. Tollady, W. Marr	S. Haslett	Cable & Wireless P.L.C.
Pacific Prestige	3.3.87	R.I.G. Calder	A.J. McLaren, D. Boardman, P.T. Galea	C. York	Furness Withy (Shipping) Ltd
Pacific Sandpiper	26.11.86	J.M. Miller	M.H. Morris, K.N. Young, P.R. Ostick	A.P. Austen	James Fisher & Sons P.L.C.
Pacific Swan	24.11.86	P.G. Hobson	T.C.R. Riley, E.W. Griffin, I. Petty	W.D. Scott	James Fisher & Sons P.L.C.
Pacific Teal	11.2.87	M.L. Miller	R.I. Cuthbert, G. Bates, J.M. Petty	P.G. Golson	James Fisher & Sons P.L.C.
Pacific Universal	13.3.87	T. Abbott	J.B. Woomble, R.A. Cotton, C.J. Garner	D. Williams	Gateway Shipping Ltd
Pegasus	20.6.86	Kaloudis Anastasios	G. Kossenas	Kalodimos Kypiakos	Kappa (Maritime) Ltd
Perseus	*				Kappa (Maritime) Ltd
Perth	18.9.86	K.D. Pykett	R. Tan, H.J. Foo, C. Bufton	J. Carneiro	Blue Star Ship Management Ltd
Petersfield	12.3.87	A. Gardiner	R.W.A. Brough, A.D. Chapman, K.V. Obeyesekera	N. Cawthorne	Buries Markes Ltd
Pholas	27.3.86	J. Steel	D.T. MacDonald, J. Downie		Coe-Metcalf Shipping Ltd
Pikebank	9.10.85	W.H. Martin	K.P. Mowat, W. Mather, P.J. Gates	G.B. Randall	Bank Line Ltd
Pointsman	28.1.87	R. Ord	D.A. Eagles, R.O.M. Low, J.D. Shelley	G.M. Duncan	Rowbotham Tankships Ltd
Pole Star	3.1.87	N. Morrison	W. Tullock, A.B. Welch		Northern Lighthouse Board
Pomella	19.11.84	D.J. Sloan	J.G. Tarling, I.R. Jack, A. Rees	J. Mercer	Shell Tankers (U.K.) Ltd
Profiler	*				Gardline Shipping Ltd
Providence Bay	25.2.87	A.M. Barker	K.D. Campbell, P.A. Trafford, C.J. Batty	D.A. Kelsall	P. & O. Containers Ltd
Puma	26.8.86	E. Wildgoose	D. McNaughton, J.T.. Jamieson	P.D. Sutcliffe	P. & O. Lines Ltd
Queen Elizabeth 2	6.11.86	T.D. Ridley	S.E. Richard-Dit-Leschery		Cunard Shipping Services Ltd
Rainbow Avenue	22.1.87	J.R. Pearson	J.M. Wood, J.D. MacKenzie, A.S. Cousins	A.W. Jones	Ocean Fleets Ltd
Rapana	24.2.86	B. Cosgrove	S.R. Holt, R.R. Phillips, G. Hill	R.J. Chapman	Shell Tankers (U.K.) Ltd
Ravenscraig	6.1.87	F. Stuart	D.J. Vickery, I. Buckley, J. Hewett	A.W.T. Camp	Ropner Management Ltd
Red Sea Endeavour	*	W. Poell	J. Bausenbach, K. Hereng, J. Assmann	W. Diehl	Hargreaves Shipping Ltd
Reefer Ciku	19.3.87	A.J. Hughes	E.C. Dela Cruz, W. Crook, I.B. Rimando	U. Pe Than	Sembawang Johnson Shipmanagement (Pte) Ltd
Reefer Duku	20.6.86	T. Chantler	How Hee Yong	Maung Chit Myint	Sembawang Johnson Shipmanagement (Pte) Ltd
Reefer Jambu	25.11.86	B. Austen-Smith	L.L. Montealegre, R.M. Gunn, See Hong Soo	Tun Myint Aung	Sembawang Johnson Shipmanagement (Pte) Ltd
Reefer Manggis	17.4.86	C.F. Campbell	Rogelio .A. Cabral, A. Bridger	S. Michael Dee	Sembawang Johnson Shipmanagement (Pte) Ltd
Reefer Nangka	10.9.85	I.Y. Batley	Gwee Chwee Kim, M.J. Winterbottom, Chon Chee Meng	Lim Soo Hock	Sembawang Johnson Shipmanagement (Pte) Ltd
Regina Oldendorff	6.1.87	M.S. Nair	T.M. Ramzil, J. Reed, V. D'Cunha	M.S. Dosanjh	Egon Oldendorff (H.K.) Ltd
Remuera Bay	30.12.86	W.C. Carruthers	M.R. Chudley, R.A. Kenchington, W.M. Winter	E. MacKenzie	P. & O. Containers Ltd
Repulse Bay	15.10.86	R.K. Shrivastava	N.S. Hardi,, R.S. Anada, S.S. Nair	P.K. Basu	Ocean Transportation S.A.
Researcher	23.2.87	H.F. Monckton	R. Gray		Gardline Shipping Ltd
Resolution	24.2.87	L.M. Wigmore	D.P. Hawkins, R.S. James		Gardline Shipping Ltd
Resolution Bay	12.3.87	J.H. Hutson	B. Cushman, A.M. Hurley, M.J. Chapman	B. Matten	P. & O. Containers Ltd
Retriever	24.5.83	A. Venables	P.M. Swan, R.C. Phillips, J. Creach	D. Steel	Cable & Wireless P.L.C.
Reynolds	30.12.86	E.H. Dillen	P. Buckley, E. Miles, V.A.P. Egan	P.J. Abdey	Bolton Maritime Management Ltd
Richfield	11.11.86	M.G. Phipps	B.A. De Zoysa, M. King, M. Johnson	D. O'Keeffe	Buries Markes Ltd
Roachbank	16.12.86	I.M. Maden	A.J. Yeaman, P.T. Thompson, A. Beattie	T.P. Williams	Bank Line Ltd
Rocknes	28.5.86	M. Meyer	R.K. Ward, A.R. Farthing, S.H. Barnet	P. Popple	Jebsens Ship Management Ltd
Rollnes	19.11.85	D. Clements	A. McClymont, C. Wilton	T. Crosby	Jebsens Ship Management Ltd
Royal Princess	25.2.85	J.R. Young	N.P. Jenkins, J.A. Smith, J.A. Croft	W.J. Smith	P. & O. Lines Ltd
Rubens	26.11.86	I. Woodier	R.P. Cobain, J. Mitchell, B. Tucker	N. McCreary	Bolton Maritime Management Ltd
Sachem	14.8.86	G. Allely	S.E. Thompson, D. Edwards, A.B. Browne	G.A. Evans	Mobil Shipping & Transportation Co.

Selected and Supplementary Ships *(contd)*

Name of Vessel	Last Return Received	Master	Observing Officers	Senior Radio Officer	Owner/Manager
Sagacity	23.11.84	W.M. Shireff	H.R. Beisly, R. Volante		F.T. Everard & Sons Ltd
St Helena	16.1.87	M.L.M. Smith	D.N.R. Roberts, R.N. Hone, C.M. Leather	N.M. Abbott	Curnow Shipping Ltd
St Nicholas	13.11.86	D. Jarvis	K.B. Leech, C. Winterton, L.O.R. Roskell	R. Mallett	Sealink (U.K.) Ltd
Salmonpool	15.10.86	R. Copeland	D. Lundy, S. Honey, L. Bridges	D. Bullard	Ropner Management Ltd
San Lorenzo	11.3.87	A.C. Matthews	J.W. Jubb, M.E. Carter, J.L. White	M.J. MacKinnon	Canadian Pacific Steamships Ltd
Santa Maria	13.1.87	C.W. Harvey	M.C. Pama	O. N. Celis	Denholm Ship Management Ltd
Scamper Universal	4.6.86	D. Forster	M. Murrison, D. Winsor, R. Hutchinson	G.R. Rudd	Gateway Shipping Ltd
Scanduich Provence	*	L. Soederberg	R. Manantan, G. Balasa, E. Torresflores	T. Vargas	Denholm Ship Management Ltd
Scotia	3.3.82	G.M. Coull	J.E. Bannister, W.H. Laws, D. Dixon	J. Steven	Department of Agriculture & Fisheries for Scotland
Scottish Star	16.3.87	D. Eckworth	C.D. Eckert, F. Robertson, S.M. Ross	W.T. Ashley	Blue Star Ship Management Ltd
Sea Princess	2.9.86	M.D. Rushan	S.D. James, S. Horne	P. Barry	P. & O. Lines Ltd
Sea Searcher	24.2.87	I.W. Crane	D.P. Hawkins, J.W. Graham, R.S. James	R.S. James	Gardline Shipping Ltd
Sea Taian	*	J.G. Houston	I.W. Whiteside, G. Shaw, W. Dawson	K. O'Sullivan	Lyle Ship Management Ltd
Seaboard Illustrious	6.11.84	J. Gillies	R. Crawford, A.F. Vincent, A.G. Maclean	C. Thompson	Seaboard Offshore Ltd
Seaboard Implacable	24.2.87	J.R. Brooks	I.A. MacLeod, F.W. Wilson, J.A. Dick		Seaboard Offshore Ltd
Seaboard Invincible	25.2.86	A.F. Vincent			Seaboard Offshore Ltd
Seaforth Clansman	9.8.83	J. Ritchie		W. Hammerton	Seaforth Maritime Ltd
Seagair	12.3.87	P. Easton	I.G. Chadwick, D.R. Chapman, N.J. Pengelly	P. Marson	B.P. Shipping Ltd
Semac I	28.8.80	J. Dobeson			Semac Services Ltd
Serenia	11.11.86	D. Spargo	S. Watson, D.R. Lake, M.D. Potts	A. Gilmour	Shell Tankers (U.K.) Ltd
Shell Explorer	16.1.87	M.J. Maclean	J.M.G. Arthur, M.J.G. Garner, C.P. Upton		Shell (U.K.) Ltd
Shetland Service	20.1.87	A.J. Clarke	N. Sheard, P.N. Poulton, M.J. Varney		Offshore Marine Ltd
Sir Alexander Glen	13.2.87	D. Willey	J.S. Clark, C.W. Blacker, W. Wood	C. Brockbank	Hudson S.S. Co. Ltd
Sir Walter Raleigh	27.11.86	M. Kichenside	D. Taylor, J. Pearn, S. Mackin	D.R. Legge	Operation Raleigh
Sky Clipper	5.3.87	D.R. Mountford	M.C. Desa, J.C. Valladares, C.R. Darnley	I.J. Peres	Fyffes Group Ltd
Snow Crystal	6.1.87	W. Lochie	A.H. Mainland, A.E.J. Pring, H.K. Underwood	S. Byrne	Wallem S.M.S. (I.O.M.) Ltd
Snow Flower	8.1.87	T. Spencer	A. Oxley, M.J.P. Lalouette, M.A. Pointon	C. Moors	Wallem S.M.S. (I.O.M.) Ltd
Sonia M.	29.8.86	J.S. Pearsall	G.P. Eyles, M. Cox	R. Merriott	Cardiff Ship Management Ltd
Southland Star	17.3.87	P.W. Hutchinson	P.A. Duggie, R. Brown, T. Wilson	G.E.J. Bailey	Blue Star Ship Management Ltd
Speciality	27.2.85	C.T. Marchant	K. Lindsay, S.K. Campbell, S. Richardson		F.T. Everard & Sons Ltd
Speedster Universal	1.10.86	R.M. Bessant	C. Eames, I. Donaldson, D. Jackson	D. Colough	Cayzer, Irvine Shipping Ltd
Stability	30.7.86	R. Bilton	R. Elliott, M.R. Irwin		F.T. Everard & Sons Ltd
Staffordshire	18.12.86	R.A.F. Edwards	W. Douglas, G. Penry, N. Michael	B. Dickinson	Bibby Line Ltd
Stainless Spray	27.8.86	K.H. Thorne		P. Greer	Turnbull Scott Management Ltd
Star World	10.11.86	J.A. Cowie	Vimal Chand, P.T. Clegg, W. Evans	Dara M. Unvala	Marine Navigation Co. Ltd
Starella	30.1.87	J.D. Cannan	J. Davies, J. Burns	J.B. Nichols	J. Marr & Son Ltd
Stellaman	17.2.87	S. Scott	M. Abbott, P.J. Wilkinson, J.H. Bates		Rowbotham Tankships Ltd
Stena Britannica	10.11.86	C.J.C. Harker	H.N.P. Aplin, A.C. Hague, R.J. Hibling, J.S.W. Dyson	K.D. MacBrayne	Northern Marine Management Ltd

Stena Carrier	*	B. Le Pine Williams	C. Atterton, G. Gardiner, J. Dyson	R. Clayton	Northern Marine Management Ltd
Stena Oceanica	10.11.86	F.R.N. Best	D.V. Lloyd, R.M. Deyes, K. Summers	P.J. Hall	Northern Marine Management Ltd
Stena Seawell	*	M. Williams			Stena Ltd
Stolt Sceptre	12.3.87	G.A. Maciver	P.A. Southworth, D.J. Williams, T.J. Culpin	J. Baldwin	Wallem S.M.S. (I.O.M.) Ltd
Stolt Stane	13.11.86	A. Rothery	D. Barrow, J. Dipple, D. Watkins	R. Humby	Wallem S.M.S. (I.O.M.) Ltd
Stolt Templar	10.12.86	H. Watson	A.W.D. Cooper, J.R. Parfitt, A.J.F. West	W.J.M. Campbell	Wallem S.M.S. (I.O.M.) Ltd
Strathbrora	30.12.86	J.S. Thorpe	J.P. Meade, D.F. Gates, K.D. Campbell	P.W. Ferguson	P. & O. Containers Ltd
Strathconon ‡	28.2.87	K.J. Owen	N.P. Woodhead, A. Lewis, L.A. Turner	P.A. Mathews	P. & O. Containers Ltd
Strider Juno	11.10.85	E.V. Judge	A.M. Naragatan, J.R. Vega, C.O. Ferraren	F.D. Mehta	Sea Containers Chartering Ltd
Suilven	1.9.86	J.N. MacDonald	A. Morrison, D.A. Gunn, C.M. Campbell	J.S. Mathers	Caledonian MacBrayne Ltd
Sulisker	16.2.87	D.K. Dickson	J.C. Barton, C. Bathgate		Ministry of Agriculture Fisheries & Food
Sumburgh Head	*	J.A. Pretswell	A. Todd, Z. Greber		Chr. Salvesen Shipping Ltd
Summity	28.11.85	R. Bilton	S.C. Richardson, P.J. Denmead	C. Sutherland	F.T. Everard & Sons Ltd
Sun Suma	16.3.87	A.W. Webber	W.K. Kung, T. Ogg, L.T. Cheng	R. McNair	Vermilion Overseas Mgmt. Co. Ltd
Swift Trader	2.3.87	R.J. Smith	R.A. Pembarton, D. Painter, N.D. Leslie		International Chartering P.L.C.
Tankerman	9.12.86	R.G. Burnet	J.M. Walker, H.J. Pearce, D.A. Jackson	P. Kelly	Rowbotham Tankships Ltd
Tectus	23.1.87	J. Brown	J.P. Bateman, C. Hall, C.C. Bain	A. Ridley	Shell Tankers (U.K.) Ltd
Telnes	15.8.86	D. Clements	D. Lloyd, M. Bailey	J. O'Driscoll	Jebsens Ship Management Ltd
Tenchbank	24.3.86	B.F.C. Bennett	N. Rich, A. Beattie, J. Munro	P. Davies	Bank Line Ltd
Texaco Westminster	1.10.85	A.W. Reeves	D.S. Sadler, M.T. Hutton, J.B. Anderson	P. Birt	Texaco Overseas Tankships Ltd
Texaco Windsor	3.2.87	D.J. Vann	P.A. Hughes, E.M. Bower	T.J. Bailey	Texaco Overseas Tankships Ltd
Toana Niugini	25.2.87	S.R. Ford	G.R. Armstrong, B. Stirling, G.D. Boyce	R.J. Cowan	Bank Line Ltd
Tokyo Bay	3.3.87	R.P. Royan	M.J. Trafford, K.W.S. MacMillan, B.L. Brierley	P.I. Pegg	P. & O. Containers Ltd
Tolaga Bay	22.1.87	J.C. Cox	S.D. Smith, I.M. Hill, R.T. Whelan	D.B. Millar	P. & O. Containers Ltd
Tor Bay	13.2.87	A.J. Palmer	D.P. Worsnop, A. Kirkham, P. Johnson	A.D. Hutchinson	P. & O. Containers Ltd
Tor Caledonia	12.7.85	A.I. Scott	G. Lockwood	G. MacKecknie	Denholm Ship Management Ltd
Tribulus	9.12.86	K.A.G. Biscoe	J.A. Reid, I. Jack, M. Frampton	M.A. O'Brien	Shell Tankers (U.K.) Ltd
Tricula	17.2.87	E.T. Longmore	T.H. Scott, V.M. Bevan, H.M. Clifford	M.A. Kadir	Shell Tankers (U.K.) Ltd
Trinidad and Tobago	13.3.87	J.S. Gavin	D.C.S. Farquhar, S. Mathurin, C.I. MacLeod	P.N. Pouchet	Bibby Line Ltd
Trouthank	2.12.86	E.T. Rees	C.W. Hardy, P.L. Griffiths, D.R. Barlow	G.B. Randall	Bank Line Ltd
Tula	*	R.E. Baker	V.M. Flores Aguilar, A.A. Field, S.F. Broderick		Cardiff Ship Mgmt. & Services Ltd
Valdivia	17.11.86	J.D. Dickinson	M.S. MacDonald, D.A. Russell, D.E. Peers	M.D. Fraser	Harrison (Clyde) Ltd
Vegaman	23.3.87	T. Thrith	S.J. Bagshaw, H.J. Pearce, P.C. Myers	J.J. Seymour	Rowbotham Tankships Ltd
Vic Bilh	2.3.87	P.W. Hillier	L.L. Wallace, P.M. Cross, M.R. Hansbridge	A.C. Harris	Fairfield-Maxwell Services Ltd
Victoria Peak	26.8.86	B.H. Agnew	S.A. Francis, S. Foster, L. Brown	P. O'Neill	Seahorse Ship Management Ltd
Victus	*	K.A. Ponnappa	S. Mehra, G.P. Ghoudhary, T.D. Payri	F. Mehta	Barber Ship Management Ltd
Vigilant	10.2.87	D.L. Rattray	J.W. Hepburn, D.L. Beveridge, J.J. Coyle		Department of Agriculture & Fisheries for Scotland
Viking Valiant	18.2.86	A.F. Bonehill	J. Nixon	G.I. Petrie	Townsend Car Ferries Ltd
Viking Venturer	3.3.87	W.J. Clarke	T.E. Nixon, J.E. Leaver, A.P. Stapley	S. Horne	Townsend Car Ferries Ltd
Viking Viscount	12.9.86	M. Edward	P.I. Hillman, P.A. Goode, M.L. Bechley	B.C. Bull	Townsend Car Ferries Ltd
Viking Voyager	*	C.E. Walford		D. Thomas	Townsend Car Ferries Ltd
Vivian M	30.12.86	R.N. Cumbers	D.F. Vaz, C. Bunt, R.J.P. Bleackley	E.J.A. Alvares	Fyffes Group Ltd
W.A. Mather	29.1.87	B.M. Jones	P.M. Bell, M. Barras, M.P. Oswin	R.E. Tucker	Canadian Pacific Steamships Ltd
Washington	12.11.85	G. Pirie	L.J. Gibb, A.P.M. Fraser, A.H. Worton	I.C. Petrie	Stephenson Clarke Shipping Ltd
Wellington Star	23.3.87	D.A. Ganderton	C.M. Grimmett, P.C. French, D.A. Parsons	G.N. Shaw	Blue Star Ship Management Ltd
Westmoor	10.2.87	D.J. Lloyd	C.A. Campbell, P. Fisken		Denholm Ship Management Ltd

Selected and Supplementary Ships *(contd)*

Name of Vessel	Last Return Received	Master	Observing Officers	Senior Radio Officer	Owner/Manager
Westra	6.1.83	T. Henderson	D.L. Beveridge, R.J. Sheldon		Department of Agriculture & Fisheries for Scotland
Wheelsman	17.11.86	P.J. Jameson	J. Whitford	A.F. Clifford	Rowbotham Tankships Ltd
Willowbank	13.1.87	P.J. Elder	M.A. MacKenzie, D.E. Ginder, K.P. Mowat	I.R. Shaw	Bank Line Ltd
Windfield	*	P. Hodge	D. De Zoysa, B. Hogarty, A. Betteridge	T. Adrian	Buries Markes (Ship Management) Ltd

'Marid' Ships

The following is a list of ships recruited for the observing and reporting of sea temperatures from the coastal waters of Great Britain. Masters are requested to point out any errors or omissions from the lists.

Name of Vessel	Master	Owners/Manager
Arco Thames	L. Webb	A.R.C. (Marine) Ltd
Ashington	R.S. Francis	Stephenson Clarke Shipping Ltd
Authenticity	N. Benson	F.T. Everard & Sons Ltd
B.P. Jouster	J.M. Kane	B.P. Oil Ltd
B.P. Warrior	R. Reit	B.P. Oil Ltd
Barra Head	J.B. Kerr	Christian Salvesen (Shipping) Ltd
Bowqueen	D. Jones	British Dredging Aggregates Ltd
Bude	W. Payne	Bowker & King Ltd
Clymene	E.A. Jones	Furness Withy (Shipping) Ltd
Columba	R. Hutcheson	Caledonian MacBrayne Ltd
Craigallian	J. Burn	J. & A. Gardner Ltd
Eastgate	A.P. Shenton	Rowbotham Tankships Ltd
Emerald	B.L. Reid	Stephenson Clarke Shipping Ltd
Esso Clyde	D.M. Campbell	Esso Petroleum Co. Ltd
Esso Fawley	R. Noakes	Esso Petroleum Co. Ltd
Esso Mersey	J. Smith	Esso Petroleum Co. Ltd
Esso Milford Haven	D. Ling	Esso Petroleum Co. Ltd
Esso Tenby	N. Powell	Esso Petroleum Co. Ltd
Frederick M	W.P. Jones	Coe-Metcalf Shipping Ltd
Garrison Point	D. Sutherland	Hudson S.S. Co. Ltd
Harting	J. McCuaig	Stephenson Clarke Shipping Ltd
Helmsman	D.H. Roberts	Rowbotham Tankships Ltd
Irishgate	R. Samson	Rowbotham Tankships Ltd
Jubilence	P. Leeman	Crescent Shipping Ltd
Kindrence	P.A. Whiting	Crescent Shipping Ltd
La Colina	R. Ley	Buries Markes (Ship Management) Ltd
La Hacienda	A. Scarratt	Buries Markes (Ship Management) Ltd
La Predera	M.C. Bowen	Buries Markes (Ship Management) Ltd
Malling	B.J. Pratt	Stephenson Clarke Shipping Ltd
Militence	D.A. Hadfield	Crescent Shipping Ltd
North Venture	C. Roberts	Silver Line Ltd
Northgate	J. Whurr	Rowbotham Tankships Ltd
Oilman	J.R. Marsden	Rowbotham Tankships Ltd
Orionman	W. Miller	Rowbotham Tankships Ltd
Peacock Venture	J.A. Mackenzie	J. & A. Gardner Ltd
Piquence	A. Affleck	Crescent Shipping Ltd
Rora Head	—. Dickson	Christian Salvesen (Shipping) Ltd
St Clair	D.C. Gray	P. & O. Lines Ltd
St Columba	L.R. Evans	Sealink (U.K.) Ltd
Shell Craftsman	M. Atkinson	Shell U.K. Oil Ltd
Shell Trader	M. Fraser	Shell U.K. Oil Ltd
Storrington	G. Young	Stephenson Clarke Shipping Ltd
Vibrence	J. Setterfield	Crescent Shipping Co. Ltd
Warden Point	L.G. Relton	Hudson S.S. Co. Ltd
Westerence	A.M. Trew	Crescent Shipping Co. Ltd

Light-vessels

Name of Vessel	Master
Channel	G. Kozzak, L.K. Parfit
Dowsing	W.H. Gibson, J. Akester
Humber	P.F.J. Hollowed, P. Wilkins
Royal Soverign (Lt Tower)	G. Hartill, V.S. Pearce
St Gowan	R.J. Owen, P.F. Newland
Sevenstones	R.J. Davies, F.D. Gayton
Smith Knoll	G.E. West, P.A. MacDonald

Oil Rigs and Platforms

Name of Rig or Platform	Owners/Operators
Aladdin	Jebsens Offshore Drilling Ltd
Ali Baba	Jebsens Offshore Drilling Ltd
Beatrice A	Britoil P.L.C.
Benlomond	Atlantic Drilling Co. Ltd
Benvrackie	Atlantic Drilling Co. Ltd
Beryl B	Mobil North Sea Ltd
Bidford Dolphin	Blandford Drilling Co. Ltd
Deep Sea Pioneer	Hamilton Brothers Oil & Gas Ltd
Dixilyn Field 96	Wood Offshore Ltd
Dixilyn Field 97	Wood Offshore Ltd
Dunlin A	Shell U.K. Exploration & Production Ltd
Dyvi Omega	Dyvi Offshore Ltd
Heather A	Unionoil Co. of G.B. Ltd
KCA Kingfisher	KCA Offshore Drilling Ltd
M.G. Hulme Jnr	Reading & Bates Ltd
Montrose A	Amoco (U.K.) Exploration co. Ltd
Morecombe Bay (API)	
Ninian Central	Chevron Petroleum (U.K.) Ltd
Santa Fe 135	Santa Fe (U.K.) Ltd
Santa Fe 140	Santa Fe (U.K.) Ltd
Sea Explorer	Jebsens Offshore Drilling Ltd
Sinbad Saxon	Jebsens Offshore Drilling Ltd
Thistle A	Britoil P.L.C.
Western Pacesetter I	Western Oceanic (U.K.) Ltd
Western Pacesetter II	Western Oceanic (U.K.) Ltd

BRITISH COMMONWEALTH

The following lists give the names of Selected and Supplementary Ships, and the number of Auxiliary Ships where known (i.e., those which only report in 'sparse areas'), which voluntarily co-operate with meteorological services of the British Commonwealth
Information for these lists is required by 31 March each year. Information for the January corrective lists is required by 30 September each year.

AUSTRALIA (Information dated 3.2.87)

Name of Vessel	Owners/Manager
Selected Ships:	
Abel Tasman	T.T. Line Tasmania
Al Khaleej	Kuwait Shipping Co.
Al Qurain	Livestock Transport & Trading Co. (Kuwait)
Al Shuwaikh	Livestock Transport & Trading Co. (Kuwait)
Al Yassrah	Rural Exporters & Traders Pty Ltd
Anro Australia	Australian National Line
Arafura	Overseas Containers Australia Pty Ltd
Ariake I	Overseas Containers Australia Pty Ltd
Arwa	Wallem Ship Management Ltd
Australia Star	Blue Star Line
Australian Advance	Australian National Line
Australian Emblem	Australian National Line
Australian Escort	Australian National Line
Australian Exporter	Australian National Line
Australian Progress	Australian National Line
Australian Prospector	Australian National Line
Australian Purpose	Australian National Line
Australian Trader	Australian National Line
Australian Venture	Australian National Line
Bass Trader	Australian National Line
B.P. Achiever	B.P. Australia Ltd
B.P. Endeavour	British Tanker Co. Ltd
B.P. Enterprise	B.P. Tankers (Aust.) Pty Ltd
Buffalo Express	Vroon B.V. Breskens
Cape Don	Department of Transport
Cape Moreton	Department of Transport
Cape Pillar	Department of Transport
Coral Chief	China Navigation Co. Ltd
Danny F	Rachid Fares Enterprises Pty Ltd
Eastern Enterprise	Howard Smith Industries Pty Ltd
Eigamoiya	Nauru Local Govt Council
Eigigu	Nauru Pacific Line
El Cordero	Cugado Shipping Co. (Panama)
El Redil	Livestock Carriers Bari (Italy)
Fernanda F	Rachid Fares Enterprises Pty Ltd
Flinders Range	Australian National Lines
Franklin	C.S.I.R.O.
Fua Kavenga	Pacific Forum Line
Hanne Bakke II	Knutsen Line Offshore
Howard Smith	Howard Smith Industries Pty Ltd
Icebird	Antarktik-und Spezial Schiffahrts Gesellschaft
Ilongo	Weeke Ship Hong Kong Ltd
Irene Greenwood	Stateships
Iron Arnhem	Broken Hill Pty Ltd
Iron Capricorn	Broken Hill Pty Ltd
Iron Carpentaria	Broken Hill Pty Ltd
Iron Curtis	Broken Hill Pty Ltd
Iron Kembla	Broken Hill Pty Ltd
Iron Kestrel	Broken Hill Pty Ltd
Iron Kirby	Broken Hill Pty Ltd
Iron Monarch	Broken Hill Pty Ltd
Iron Newcastle	Broken Hill Pty Ltd
Iron Pacific	Broken Hill Pty Ltd
Iron Prince	Broken Hill Pty Ltd
Iron Shortland	Broken Hill Pty Ltd
Iron Somersby	Broken Hill Pty Ltd
Iron Spencer	Broken Hill Pty Ltd
Nimos	China Navigation Co. Ltd
Nivosa	Shell Co. of Australia Ltd
Oceanic Crest	Japan Line Ltd Tokyo
Ormiston	Colonial Sugar Refinery Ltd
Pathfinder II	Panore Shipping Co. New York
Pilbara	Stateships

Australia *(contd)*

Name of Vessel	Owners/Manager
Prospector II	Panore Shipping Co. New York
Papuan Chief	China Navigation Co. Ltd
Rig Seismic	Bureau of Mineral Resources
River Boyne	Australian National Line
River Embley	Australian National Line
River Torrens	Australian National Line
Sahiwal Express	Dens Ocean Pty Ltd
Seaway Hobart	Union S.S. Co. of Australia
Siba Queen	Italcattle S.p.A. Bari
Sid McGrath	John Burke Shipping
Soela	C.S.I.R.O.
Swan Reefer	Sea Containers Ltd
TNT Altrans	T.N.T. Bulkships Ltd
TNT Capricornia	T.N.T. Bulkships Ltd
TNT Carpentaria	T.N.T. Bulkships Ltd
Tourcoing	Scan Austral Asiatic Shipping Line
Troubridge	S.A. State Government
Uniceb	Livestock Carriers Bari (Italy)
Wyuna	Australian Maritime College
Xiang Yang Hong 5	State Oceanic Administration, South China Sea
Supplementary Ship:	
Neptune Seginus	Heatherington Westfarmers

CANADA (Information dated 1.1.87)

Name of Vessel	Owners/Manager
Ad Astra	Barber Ship Management Ltd
Advent	Government of Canada
Alberni Dawn	Man Cheung Yuen Services Ltd
Alert	Government of Canada
Arctic	Canarctic Shipping Co. Ltd
Atlantic Wing	Act Maritime Co. Ltd
Baffin	Government of Canada
Bayfield	Government of Canada
Beiner	Marine Institute of Newfoundland
Bergen Arrow	Jardine Ship Management Ltd
Bibi	Sir William Reardon Smith & Sons Ltd
Bluenose	Canadian National (Marine)
Bow Drill I	Huskey/Bow Valley Offshore Drilling Ltd
Bow Drill III	Huskey/Bow Valley Offshore Drilling Ltd
Brandal	Karlson Shipping Co. Ltd
Brierfield	Buries Markes (Ship Management) Ltd
Camsell	Government of Canada
Canadian Ace	Montreal Shipping Ltd
Cape Roger	Government of Canada
Chebucto	Government of Canada
Chennai Nermai	South India Shipping Corp. Ltd
Citadel Hill	Barber Ship Management Ltd
Coastal Canada	Greater Sarnia Investment Corp.
Cygnus	Government of Canada
Dawson	Government of Canada
Des Groseillers	Government of Canada
Earl Grey	Government of Canada
Eastern Maid	Indo-China S.N. Co. Ltd
Egda	Indo-China S.N. Co. Ltd
Edward Cornwallis	Government of Canada
F.C.G. Smith	Government of Canada
Fjord Thistle	Indo-China S.N. Co. Ltd
Fort Calgary	Canadian Pacific Steamships Ltd
Fort Kamloops	Canadian Pacific Steamships Ltd
Fort Nanaimo	Canadian Pacific Steamships Ltd
Fort Nelson	Canadian Pacific Steamships Ltd
Fort Yale	Canadian Pacific Steamships Ltd

CANADA *(contd)*

NAME OF VESSEL	OWNERS/ MANAGER
F.P. Clipper	East Asiatic Co. Ltd
Friendship	Friendship Carrier Inc.
Fuhwo Venture	Indo-China S.N. Co. Ltd
G.B. Reed	Government of Canada
George E. Darby	Government of Canada
George R. Pearkes	Government of Canada
Great Jade	World-wide Shipping Agency Ltd
Great Prize	Wak Tung Shipping Co. Ltd
Grena	Jardine Ship Management Ltd
Grenfell	Government of Canada
Harmac Dawn	Man Cheung Yuen Services Ltd
Hudson	Government of Canada
Irving Canada	Kent Lines Ltd
Irving Eskimo	Kent Lines Ltd
Irving Forest	Kent Lines Ltd
Irving Ocean	Kent Lines Ltd
Island Princess	P. & O. Lines Ltd
J.E. Bernier	Government of Canada
Jackman	Government of Canada
James Sinclair	Government of Canada
Jean Paquin	Logistic Navigation Co. Ltd
John A. Macdonald	Government of Canada
John Cabot	Government of Canada
John P. Tulley	Government of Canada
Kemano	Jardine Ship Management Ltd
Labrador	Government of Canada
Lakeshell	Shell Oil (Marine) Co. Ltd
Leonard J. Cowley	Government of Canada
Limnos	Government of Canada
Louis M. Lauzier	Navmar Corp.
Louis S. St Laurent	Government of Canada
Louisburg	Government of Canada
Lucien Paquin	Logistic Navigation Co. Ltd
Martha L. Black	Government of Canada
Mary Hichens	Government of Canada
Maxwell	Government of Canada
Montcalm	Government of Canada
Nahidik	Government of Canada
Namao	Government of Canada
Nandu Arrow	Jardine Ship Management Ltd
New Zealand Alliance	Shipping Corporation of N.Z.
Nordglimt	Norden Steamship Co. Ltd
Nordkyn	Norden Steamship Co. Ltd
Norman McLeod Rogers	Government of Canada
Northern Shell	Shell Oil (Canada) Ltd
Pacific Princess	P. & O. Lines Ltd
Pandora II	Government of Canada
Parizeau	Government of Canada
Pierre Radisson	Government of Canada
Princess of Acadia	Canadian National (Marine)
Queen of Prince Rupert	British Columbia Ferries
Queen of the North	British Columbia Ferries
Raven Arrow	Indo-China S.N. Co. Ltd
Rimba Maranti	Malaysian International Shipping Corp.
Rowan Gorilla I	Rowan Companies Ltd
Royal Princess	P. & O. Lines Ltd
Sedco 710	Petro Canada
Simon Fraser	Government of Canada
Sir Humphrey Gilbert	Government of Canada
Sir James Douglas	Government of Canada
Sir John Franklin	Government of Canada
Sir Wilfred Laurier	Government of Canada
Sir William Alexander	Government of Canada
Skeena	Reardon Smith Lines Ltd
Star Everwin	Man Cheung Yuen Services Ltd
Star Magnate	Marine Navigation Co. Ltd
Summerfield	Buries Markes Ship Management Ltd
Sun Maya	Fuji Shipping Co. Ltd
Sun Princes	P. & O. Lines Ltd
Sun Rokko	Gearbulk Shipping Agency Ltd
Star Sulu	Vinta Maritime Co. Ltd
T. Akasaka	Canadian Pacific Steamships Ltd
Tanu	Government of Canada

CANADA *(contd)*

Name of Vessel	Owners/Manager
Thomas Carleton	Government of Canada
Thor I	Thor Dahl Lines
Thorscape	Thor Dahl Lines
Trudy	Souter Shipping Ltd
Tsekoa II	Government of Canada
Tupper	Government of Canada
United Drive	International Shipping Agency Ltd
Western Valley	Reardon Smith Lines Ltd
W.E. Ricker	Government of Canada
Wilfred Templeman	Government of Canada
Wolfe	Government of Canada

Auxiliary Ships:

Canada has 234 ocean-going Auxiliary Ships and 114 Auxiliary Ships operating on the Great Lakes and Inland Waters.

HONG KONG (Information dated 28.2.87)

Name of Vessel	Owners/Manager
Selected Ships:	
Acacia	Mercury Shipping Co. Ltd
Als Harmony	Ahrenkiel Liner Service (H.K.) Ltd
Asian Jade	Swire Shipping (Agencies) Ltd
Asian Pearl	Swire Shipping (Agencies) Ltd
Asian Thistle	Orient Overseas Management and Finance Ltd
Barber Tampa	Barber Wilhelmsen Agencies Ltd
Barber Perseus	Barber Wilhelmsen Agencies Ltd
Boonkrong II	Chin Seng Hong Ltd
Bunga Kantan	Malaysian International Shipping Corp. Berhad
Bunga Suria	Malaysian International Shipping Corp. Berhad
C.R. Abidjan	Wallem Shipping (H.K.) Ltd
C.R. Douala	Wallem Shipping (H.K.) Ltd
C.R. Pointe Noire	Wallem Shipping (H.K.) Ltd
Castle Peak	Blue Star Ship Management Ltd
Chengtu	Swire Shipping (Agencies) Ltd
Concordia Sun	Barber Ship Management Ltd
Coral Princes	Swire Shipping (Agencies) Ltd
Feoso Ambassador 2	Feoso Maritime Ltd
Gonosan	Unique Shipping Agencies Ltd
Halldor	Thoresen Ship Management Ltd
Hawk Arrow	Indo-China S.N. Co. (H.K.) Ltd
Hong Kong Container	Orient Overseas Management and Finance Ltd
Jebsen Tauranga	Kristian Jebsens Ltd
Kweilin	Swire Shipping (Agencies) Ltd
Malvern	Denholm Ship Management Ltd
Maritime Cargendenia	International Maritime Carriers Ltd
Maritime Champion	International Maritime Carriers Ltd
Maritime Express	International Maritime Carriers Ltd
Maritime Goliath	International Maritime Carriers Ltd
Maritime Noble	International Maritime Carriers Ltd
Musing	Ocean Tramping Co. Ltd
Neptune Agate	H.K. Trident Shipping Agency Co. Ltd
New Oasis	Wing Tak Shipping Agency Ltd
Ocean Container	Miltrend Shipping Ltd
Ocean Elite	Wing Tak Shipping Agency Ltd
Ocean Sincerity	Wing Tak Shipping Agency Ltd
Ocean Strength	Wing Tak Shipping Agency Ltd
Oriental Ambassador	Orient Overseas Management and Finance Ltd
Oriental Chief	Orient Overseas Management and Finance Ltd
Oriental Expert	Island Navigation Corp. Ltd
Oriental Fair	Orient Overseas Container Line Ltd
Oriental Freedom	Orient Overseas Management and Finance Ltd
Osprey Arrow	Indo-China S.N. Co. (H.K.) Ltd
Pacific Container	Miltrend Shipping Ltd
Pearl of Scandinavia	Pearl Cruises Catering (H.K.) Ltd

Hong Kong *(contd)*

Name of Vessel	Owners/Manager
Porthmeus	Barber Ship Management Ltd
Raya Glory	Ocean Tramping Co. Ltd
R.R. Ratna	Orient Overseas Container Line Ltd
Sea Architect	Interocean Shipping Co. Ltd
Sirichai Bulakul	Chin Seng Hong Ltd
Tachibana	Barber Ship Management Ltd
Thai Jade	Orient Overseas Management and Finance Ltd
Thai Tubtim	Orient Overseas Management and Finance Ltd
Tokyo Bridge	Orient Overseas Management and Finance Ltd
Willine Taiko	Jardine Shipping Agencies (H.K.) Ltd
Yuen Chau	Miltrend Shipping Ltd
Supplementary Ships:	
Admiralty Island	Miltrend Shipping Ltd
Als Reliance	Ahrenkiel Liner Service (H.K.) Ltd
Beau Succes	World-wide Shipping Agency Ltd
California Venus	N.Y.K. Line (H.K.) Ltd
Eastern Express	Unique Shipping Agencies Ltd
Hallvard	Thoresen Ship Management Ltd
Hugheverett	Everett Steamship Corp. S/A
Iligan	Unique Shipping Agencies Ltd
Island Container	Miltrend Shipping Ltd
Jebsen Napier	Kristian Jebsens Ltd
Jebsen Timaru	Kristian Jebsens Ltd
Johneverett	Everett Steamship Corp. S/A
Kitano Maru	N.Y.K. Line (H.K.) Ltd
Manoloeverett	Everett Steamship Corp. S/A
Maritime Triumph	International Maritime Carriers Ltd
Morning Grace	Wing Tak Shipping Agency Ltd
Ngan Chau	Miltrend Shipping Ltd
Oriental Knight	Orient Overseas Container Line Ltd
Oriental Explorer	Orient Overseas Container Line Ltd
Oriental Patriot	Orient Overseas Container Line Ltd
Raya Fortune	Ocean Tramping Co. Ltd
Seamaster I	Interocean Shipping Co. Ltd
Silver Clipper	Valles Steamship Co. Ltd
Thai Amber	Orient Overseas Container Line Ltd
Theben	Barber Ship Management Ltd
Thomaseverett	Everett Steamship Corp. S/A
World Ranger	World-wide Shipping Agency Ltd

Auxiliary Ships:

Hong Kong also has 1 Auxiliary Ship currently reporting.

INDIA (Information dated 1.1.87)

Name of Vessel	Owners/Manager
Selected Ships:	
Akbar	Shipping Corporation of India
Andamans	Shipping Corporation of India
Bharatendu	Shipping Corporation of India
B.R. Ambedkar	Shipping Corporation of India
Chennai Selvam	South India Shipping Corp. Ltd
Gaveshani	Government of India
Harsha Vardhan	Shipping Corporation of India
Jalazad	Scindia Steam Navigation Co.
Jalajyoti	Scindia Steam Navigation Co.
Jalamoti	Scindia Steam Navigation Co.
Jalarajan	Scindia Steam Navigation Co.
Jalayamini	Scindia Steam Navigation Co.
Lokmanya Tilak	Shipping Corporation of India
Nancowry	Shipping Corporation of India
Ratna Nandini	Ratnakar Shipping Co.
Sagar Kanya	Shipping Corporation of India
Sagar Sampada	Shipping Corporation of India

INDIA (contd)

Name of Vessel	Owners/Manager
Shompen	Shipping Corporation of India
State of Andhra Pradesh	Shipping Corporation of India
State of Mysore	Shipping Corporation of India
State of Nagaland	Shipping Corporation of India
State of West Bengal	Shipping Corporation of India
Vishnu Sagar	Parekh Ocean Carriers
Vishva Anurag	Shipping Corporation of India
Supplementary Ships:	
A.B. Tarapore Col	Shipping Corporation of India
Ajanta	Shipping Corporation of India
Al Gilani	Allana Shipping Co.
Annapurna	Shipping Corporation of India
Anupama	Shipping Corporation of India
Apj Ambika	Surrendra Overseas Ltd
Apj Anand	Surrendra Overseas Ltd
Apj Anjali	Surrendra Overseas Ltd
Apj Angad	Surrendra Overseas Ltd
Apj Sushma	Surrendra Overseas Ltd
Apj Priya	Surrendra Overseas Ltd
Lt Arun Khetrapal PVC	Shipping Corporation of India
Arunachal Pradesh	Shipping Corporation of India
Aradhana	Shipping Corporation of India
Archana	Shipping Corporation of India
Barauni	Shipping Corporation of India
Bhagat Singh	Shipping Corporation of India
Bharat Seema	Shipping Corporation of India
Bhaskara	Shipping Corporation of India
Bhavabhuti	Shipping Corporation of India
Chanakya	Shipping Corporation of India
Chandidas	Shipping Corporation of India
Chennai Jayam	South India Shipping Corp.Ltd
Chennai Muyarchi	South India Shipping Corp.Ltd
Chennai Perumai	South India Shipping Corp.Ltd
Chennai Sadhanai	South India Shipping Corp.Ltd
Chennai Valarchi	South India Shipping Corp.Ltd
Chennai Veeram	South India Shipping Corp.Ltd
Chattrapati Shivaji	South India Shipping Corp. Ltd
Deep Setu	South India Shipping Corp. Ltd
Devaraya	South India Shipping Corp. Ltd
Diglipur	South India Shipping Corp. Ltd
Fonj Shekon PVC	South India Shipping Corp. Ltd
Guru Bachan Singh	South India Shipping Corp. Ltd
Homi Bhabha	South India Shipping Corp. Ltd
Indian Endurance	India Steamship Co.
Indian Explorer	India Steamship Co.
Indian Faith	India Steamship Co.
Indian Fame	India Steamship Co.
Indian Fraternity	India Steamship Co.
Indian Freedom	India Steamship Co.
Indian Grace	India Steamship Co.
Indian Goodwill	India Steamship Co.
Indian Industry	India Steamship Co.
Indian Progress	India Steamship Co.
Indian Prosperity	India Steamship Co.
Indian Triumph	India Steamship Co.
Indian Valour	India Steamship Co.
Indian Venture	India Steamship Co.
INS Kripan	Naval ship
Jag Anjali	Great Eastern Shipping Co.
Jag Dharma	Great Eastern Shipping Co.
Jag Doot	Great Eastern Shipping Co.
Jag Jiwan	Great Eastern Shipping Co.
Jag Krishi	Great Eastern Shipping Co.
Jag Manek	Great Eastern Shipping Co.
Jag Pari	Great Eastern Shipping Co.
Jag Prakash	Great Eastern Shipping Co.
Jag Preeti	Great Eastern Shipping Co.
Jag Rekha	Great Eastern Shipping Co.
Jag Shakti	Great Eastern Shipping Co.
Jag Shanti	Great Eastern Shipping Co.
Jagat Kirti	Dempo Steamship Co.

Name of Vessel	Owners/Manager
Jagat Samrat	Dempo Steamship Co.
Jagat Swamini	Dempo Steamship Co.
Jagat Vijeta	Dempo Steamship Co.
Jalabala	Scindia Steam Navigation Co.
Jalagouri	Scindia Steam Navigation Co.
Jalagovind	Scindia Steam Navigation Co.
Jalagodavari	Scindia Steam Navigation Co.
Jalajaya	Scindia Steam Navigation Co.
Jalakala	Scindia Steam Navigation Co.
Jalamani	Scindia Steam Navigation Co.
Jalamurugan	Scindia Steam Navigation Co.
Jalamatsya	Scindia Steam Navigation Co.
Jalamayur	Scindia Steam Navigation Co.
Jalamohan	Scindia Steam Navigation Co.
Jalamokambi	Scindia Steam Navigation Co.
Jalamudra	Scindia Steam Navigation Co.
Jalaputra	Scindia Steam Navigation Co.
Jalarashmi	Scindia Steam Navigation Co.
Jalatapi	Scindia Steam Navigation Co.
Jalavallabh	Scindia Steam Navigation Co.
Jalavijaya	Scindia Steam Navigation Co.
Jalajaya	Scindia Steam Navigation Co.
Jalayamuna	Scindia Steam Navigation Co.
Jameela	Shipping Corporation of India
Janapriya	Shipping Corporation of India
Jawahari al Nehru	Shipping Corporation of India
Jay Ambika	Jay Shree Shipping Co.
Jay Laxmi	Jay Shree Shipping Co.
Jaynarayan Vyas	Shipping Corporation of India
Joginder Singh	Shipping Corporation of India
Kabirdas	Shipping Corporation of India
Kalidas	Shipping Corporation of India
Kanchan Junga	Shipping Corporation of India
Kanishka	Shipping Corporation of India
Kolandia	South India Shipping Corp. Ltd
Lal Bahadur Shastri	Shipping Corporation of India
Lance Naik Albert Ekka	Shipping Corporation of India
Laxmi	Shipping Corporation of India
Lok Manya	Shipping Corporation of India
Lok Maheshwari	Shipping Corporation of India
Lok Nayak	Shipping Corporation of India
Lok Palak	Shipping Corporation of India
Lok Preeti	Shipping Corporation of India
Lok Sahayyak	Shipping Corporation of India
Lok Vihar	Shipping Corporation of India
Lok Vikas	Shipping Corporation of India
Lok Vivek	Shipping Corporation of India
Lok Vinay	Shipping Corporation of India
Mahabhakti	Shipping Corporation of India
Mahabir	Shipping Corporation of India
Mahavijay	Shipping Corporation of India
Maharashmi	Shipping Corporation of India
Maharshi Dayanand	Shipping Corporation of India
Maharshi Karve	Shipping Corporation of India
Maratha Elegance	Chowgule Steamship, Co.
Maratha Melody	Chowgule Steamship, Co.
Maratha Prudence	Chowgule Steamship, Co.
Meghdoot	Varuna Shipping Co.
Meghrab	Shipping Corporation of India
Mizoram	Shipping Corporation of India
MMP Wealth	M.M.P. Lines Ltd
M.O.T. Dredge	Shipping Corporation of India
Naik Jadunath Singh	Shipping Corporation of India
Nand Hari	Essar Shipping Ltd
Nand Kala	Essar Shipping Ltd
Nand Kavita	Essar Shipping Ltd
Nand Kishore	Essar Shipping Ltd
Netaji Subhash Bose	Shipping Corporation of India
Nitya Amar	Maini Shipping Co.
Nirvan Vishnu	Nirvan Shipping Co.
Onge	Shipping Corporation of India
Prabhu Gopal	Tolani Shipping Co.

INDIA (contd)

Name of Vessel	Owners/Manager
Prabhu Puni	Tolani Shipping Co.
Prabhu Satram	Tolani Shipping Co.
Rafi Ahmed Kidwai	Shipping Corporation of India
Ramdas	Shipping Corporation of India
Ratnar Shobhana	Ratnakar Shipping Co.
Ratnar Vandana	Ratnakar Shipping Co.
Ratnar Kirti	Ratnakar Shipping Co.
Ravidas	Shipping Corporation of India
Sagar Samrat	Oil & Natural Gas Commission of India
Sagar Deep	Shipping Corporation of India
Samudra Gupta	Shipping Corporation of India
Samudra Jyoti	Shipping Corporation of India
Sanchi	Shipping Corporation of India
Sarojini Naidu	Shipping Corporation of India
Sai Nanak	TBS Shipping Co.
Satya Kamal	Seven Seas Shipping Transportation
Satya Murthi	Shipping Corporation of India
Satya Padam	Seven Seas Shipping Transportation
Satya Sohan	Seven Seas Shipping Transportation
Sahajahan	Shipping Corporation of India
State of Gujarat	Shipping Corporation of India
State of Haryana	Shipping Corporation of India
State of Kerala	Shipping Corporation of India
State of Manipur	Shipping Corporation of India
State of Madya Pradesh	Shipping Corporation of India
State of Orissa	Shipping Corporation of India
State of Rajasthan	Shipping Corporation of India
Subedar Joginder Singh	Shipping Corporation of India
Testa	Mackinnon Shipping Co.
Tulsidas	Shipping Corporation of India
Unibaksh	Shipping Corporation of India
Vallabhai Patel	Shipping Corporation of India
Varuna Adhar	Varuna Shipping Co.
Vishva Aditya	Shipping Corporation of India
Vishva Ajay	Shipping Corporation of India
Vishva Ambar	Shipping Corporation of India
Vishva Amitabh	Shipping Corporation of India
Vishva Apurva	Shipping Corporation of India
Vishva Asha	Shipping Corporation of India
Vishva Bandhan	Shipping Corporation of India
Vishva Bhakti	Shipping Corporation of India
Vishva Dharma	Shipping Corporation of India
Vishva Karuna	Shipping Corporation of India
Vishva Kaumudi	Shipping Corporation of India
Vishva Madhuri	Shipping Corporation of India
Vishva Mahima	Shipping Corporation of India
Vishva Mamta	Shipping Corporation of India
Vishva Mohini	Shipping Corporation of India
Vishva Nandini	Shipping Corporation of India
Vishva Pallav	Shipping Corporation of India
Vishva Pankaj	Shipping Corporation of India
Vishva Parag	Shipping Corporation of India
Vishva Parijat	Shipping Corporation of India
Vishva Parimal	Shipping Corporation of India
Vishva Seva	Shipping Corporation of India
Vishva Shakti	Shipping Corporation of India
Vishva Shobha	Shipping Corporation of India
Vishva Siddhi	Shipping Corporation of India
Vishva Tarang	Shipping Corporation of India
Vishva Tirth	Shipping Corporation of India
Vishva Umang	Shipping Corporation of India
Vishva Vikram	Shipping Corporation of India
Vishva Yash	Shipping Corporation of India
Vishwesharayya	Shipping Corporation of India
Vivekanand	Shipping Corporation of India
Yerawa	Shipping Corporation of India
Zakir Hussain	Shipping Corporation of India

Auxiliary Ships:

India also has a fleet of 36 Auxiliary Ships currently reporting.

NEW ZEALAND (Information dated 1.2.87)

Name of Vessel	Owners/Manager
Selected Ships:	
ACT 3	Blue Port ACT (N.Z.) Ltd
ACT 4	Blue Port ACT (N.Z.) Ltd
ACT 5	Blue Port ACT (N.Z.) Ltd
Amokura	Union Maritime Services Ltd
Aotea	Container Fleets (N.Z.) Ltd
Auckland Express	Tasman Express Line
Bounty III	Pacific Lines
Canterbury Express	Tasman Express Line
Capitaine Cook III	Sofrana Unilines
Capricornia	Polynesia Triangle Line
Cordella	Skeggs Foods Ltd
Cormorant Arrow	Gearbulk Shipping Ltd
Daniel Solander	Solander Fisheries Ltd
Fetu Moana	Shipping Corporation of N.Z.
Fijiian	Reef Shipping Agenices
Forum Samoa	Pacific Forum Line
Golden Bay	Tarakohe Shipping Co.
Holmdale	Union Maritime Services Ltd
James Cook	N.Z. Government (Fisheries Research)
Jebsen Tauranga	Jebsen N.Z. Ltd
Kaharoa	Fisheries Research Division
Kolle D.	Nauru Pacific Line
Kotuku	Union Maritime Services Ltd
Kuaka	Union Maritime Services Ltd
Mandama	Blue Port ACT (N.Z.) Ltd
N.Z. Caribbean	Shipping Corporation of N.Z.
N.Z. Mariner	Shipping Corporation of N.Z.
N.Z. Pacific	Shipping Corporation of N.Z.
New Zealand Trader	Shipping Corporation of N.Z.
Ngahere	Union Maritime Services Ltd
Pacific Ataawhai	Shell B.P. Todd Consortium
Rapuhia	DSIR/Union Maritime Services Ltd
Spirit of Competition	Pacifica Shipping Co.
Taiko	Union Maritime Services Ltd
Tasman Enterprise	Union Maritime Services Ltd
Tasman Venture	Union Maritime Services Ltd
Tiare Moana	Shipping Corporation of N.Z.
Tui Cakau III	Pacific Lines
Union Auckland	Union Maritime Services Ltd
Union Endeavour	Union Maritime Services Ltd
Union Rotoiti	Union Maritime Services Ltd
Union Rotorua	Union Maritime Services Ltd
Westport	N.Z. Cement Holdings Ltd
Supplementary Ships:	
Arahanga	New Zealand Railways
Arahura	New Zealand Railways
Aratika	New Zealand Railways
Ile de Lumiere II	Sofrana Unilines

Auxiliary Ships:

New Zealand also has a fleet of 12 Auxiliary Ships currently reporting.

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